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LIFT BRIDGE AT MILWAUKEE.

(Illustrated.)

It has for years been beyond the comprehension of the ordinary citizen as well as those closely connected with marine interests why some departures in bridge structures spanning the narrow creeks at all lake ports could not be devised by the engineering talent of at least this section of the country.

It had become the general custom to follow the original plan of construction and place a large abutment in the center of the creek on which the bridge should swing,

vantage by a comparison with the ordinary type of swing-bridge very largely used at neighboring streets on this same river. On these the clear width of roadway is only 18 feet with 7 feet sidewalks. To increase the roadway to 34 feet on this type would require that the movable span extend entirely across the river, in order that room be had on either side of the center pier for navigation. That the cost for a pier and turntable of sufficient size to support a bridge of this width would be enormous is clearly evident. Furthermore, the center pier for the swing-bridge type would obstruct the best part of the

three rows of fender piles with intermediate timbers, the front row reaching as high as 8 feet above datum to guard the iron work of the bridge against overhanging parts of boats.

The movable span was designed to sustain a live load of 100 lbs. per square foot of roadway, and 80 lbs. per square foot of sidewalk, uniformly distributed; to this was added a concentrated live load of two street cars weighing 18 tons each, moving side by side. The allowed unit strains on steel were tension in bars 14,000 lbs.; tension in plates and shapes 12,000 lbs.

All steel was inspected at the mill and all rivet holes were reamed out one-eighth of an inch.

The structure was erected without falseworks, by putting the movable parts together in an upright position. The stationary parts were first put up from the shore by a boom derrick, which was afterwards shifted to the forward end of the approach span. After nearly all the iron work of the lift spans, part of the counterweight and all parts of the machinery were in place, the bridge was lowered into its closed position to receive the flooring. As the channel had to be kept open, the bridge had always to be kept ready to be lifted for passing boats.

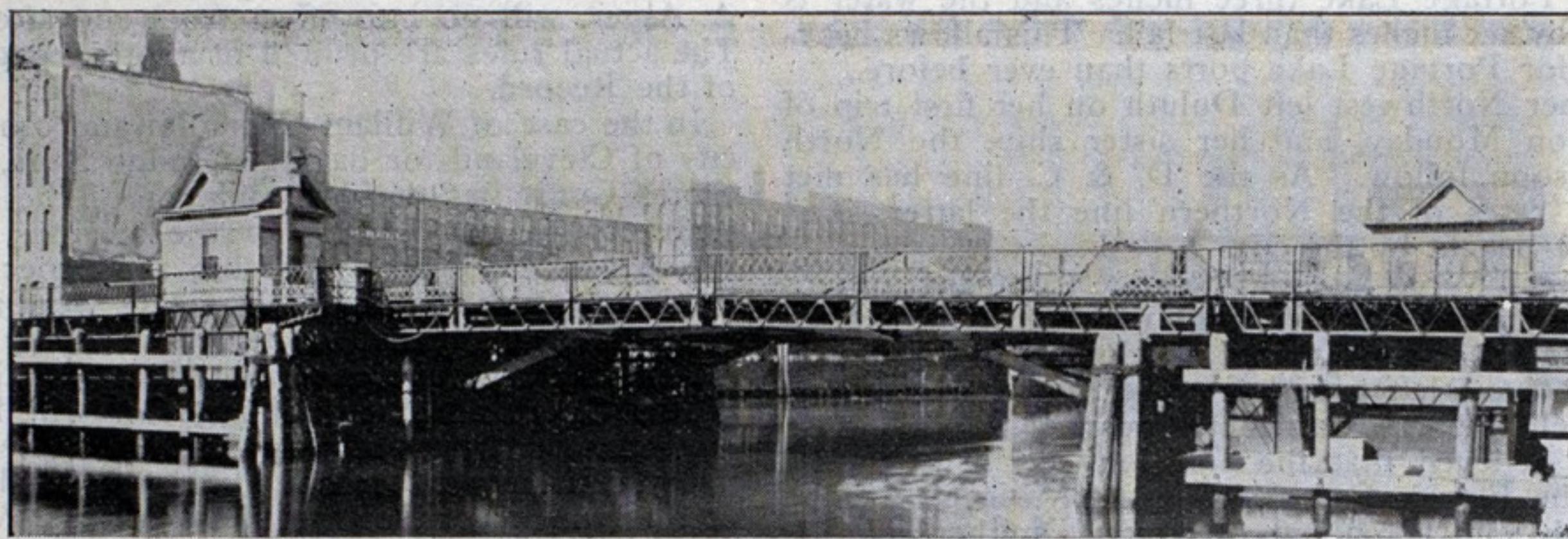
The roadway of the stationary part is formed by 7-inch cedar blocks resting on two layers of long leaf yellow pine planking, 1 inch and 4 inches thick, respectively. The roadway of the movable span consists of two layers of white oak planking, 2-inch and 3-inch thick girder. The counterweight is also equally distributed on the two parts of the left girder.

The amount of counterweight required for each movable part is a little over 100,000 lbs., and the total weight of each movable part is 255,000 lbs.; this, of course, includes the counterweight.

The contract for the superstructure was taken by the Milwaukee Bridge & Iron Works at a price of \$23,800. The execution of the work was carried out by Mr. Fred Moore, engineer of the company, and Mr. J. Hahn, the superintendent of the shop.

NEW TONNAGE.

The Bureau of Navigation, Treasury Department, Wash-



A NEW MILWAUKEE BRIDGE, CLOSED.
Showing a span without center abutments.

these abutments with their guards, outstanding piles, etc. taking up the most valuable portion of the river and amounting to a permanent obstruction of from thirty to forty feet wide and ten times that measurement in length. Should an accidental obstruction of similar dimensions ever have taken place at any of the numerous points near where these purposely placed structures are permitted to take up the best portions of the rivers we venture to say that it would be peremptorily removed in short order.

Through articles appearing in the columns of the Marine Record, and from other sources, the attention of talented men became directed to this feature of purposely obstructing commerce and navigation throughout the narrow rivers or perhaps more properly called creeks feeding the largest lake ports with the best trade that they could enjoy.

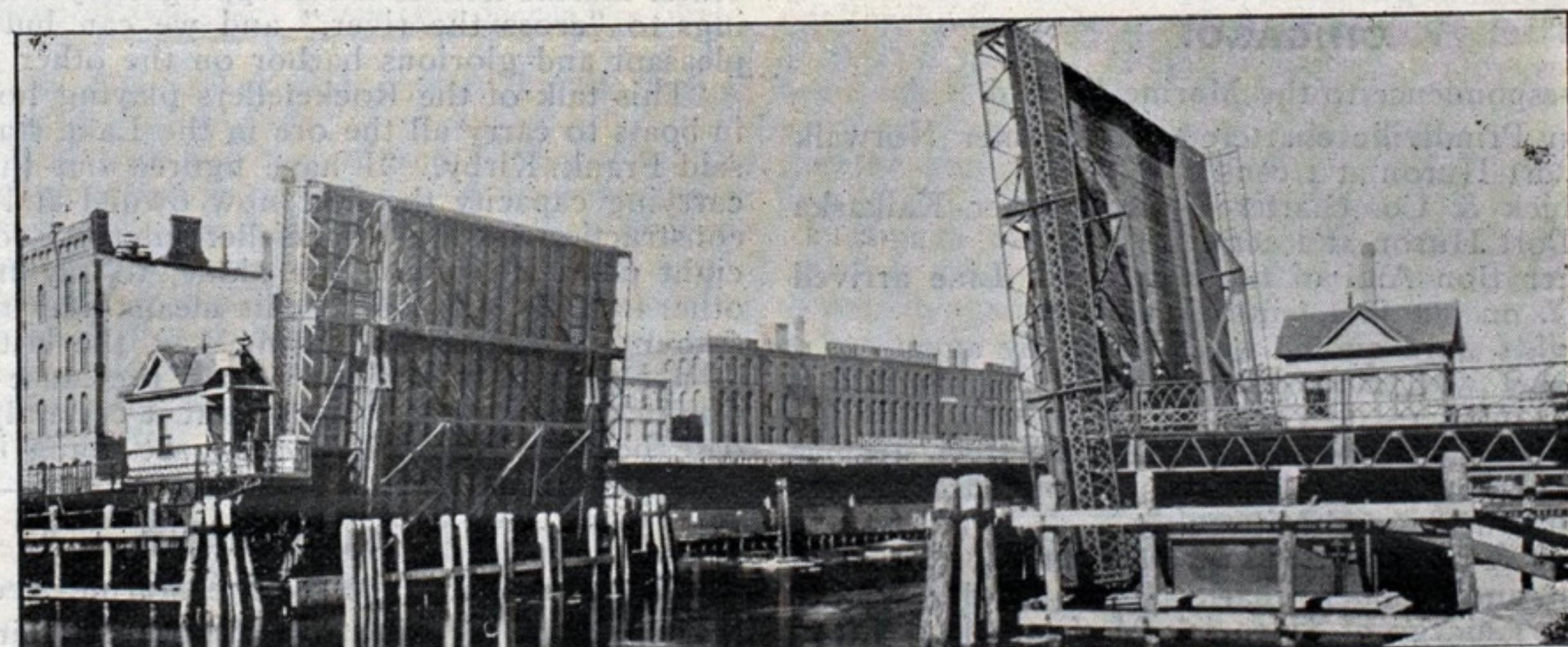
In this connection we desire to say that the abilities of our friend M. G. Schinke assistant city engineer at Milwaukee were called into requisition and he ably met the call by designing one of the best bridges extant, that is, for the purposes of crossing the narrow streams which we have on the lakes.

The problem to be met by this form of structure was to secure at a minimum cost a bridge of sufficient width to accommodate the congested street travel across the river and which would require the least possible time for opening and closing. In addition it must answer the following requirements, peculiar to the location: It must rise but slightly above the street level on either side; it must leave a prescribed width of clear channel for navigation, and it must encroach as little as possible upon room needed for docking purposes alongside. The width of the river at this point is 220 feet.

How well the solution of the task was accomplished may be appreciated from the fact that a bridge with a clear roadway 34 feet wide, and two sidewalks each 7 feet wide in the clear, giving a navigable center channel 78 feet wide in the clear, which could be opened or closed in 30 seconds, was had at a total cost of \$48,100. The floor of the bridge at the middle of the span is but 13.5 feet above datum, so that the grade of the roadway from the street is but slightly ascending. The other points of superiority of this type of construction may be seen to best ad-

channel, not to speak of the dock space cut off at the four corners by the swinging circle.

The substructure consists of two shore abutment walls about 80 feet long each, and four piers 10x25 feet each. All of the masonry rest on piles driven to a depth of 57 feet below datum to reach a stratum of sufficient solidity. The piles under the abutment walls are cut off 5 feet below datum to receive the grillage. The bottom of the masonry is 3.5 feet below datum. The abutment walls are held in place against earth pressure by anchor rods held by piles, driven about 24 feet back of the abutment. The four piers for the movable parts consist of four Portland cement blocks, 10x25 feet in plan



A MILWAUKEE BRIDGE, OPENED FOR THE PASSAGE OF VESSELS AS ABOVE.

and 10 feet high, resting upon a timber grillage for which the piles were cut off 15 feet below datum. The concrete is surrounded by Wakefield sheet piling 8 inches thick. The tops of the pier are one foot above datum, the upper part of each being formed by three courses of Menominee limestone 3 feet 6 inches thick altogether. The sheeting is held in place by an oak wale-streak 6x12 inches in section, well secured at the corners.

The piers are protected at the corners by four groups of piles, each group containing ten piles, and in front by

ington, D. C., have assigned official numbers and tonnage proportions to the following lake-built vessels for the week ending June 5, 1897: Off. No. 107282, Antrim, sailing, 3,200.49 gross and 2,902.76 net tons, built in and owned at Cleveland, O. Off. No. 30089, barge Amazon, 3,599.09 gross and 3,331.55 net tons, built at Chicago and owned in Cleveland, O. The foregoing with the addition of small tonnage represents the lake shipbuilding for the above mentioned time, yet upwards of 7,000 tons in one week shows a fairly good register in shipbuilding circles for Cleveland owned vessels.

NEWS AROUND THE LAKES.

BUFFALO.

Special Correspondence to the Marine Record.

The Inter Ocean over-ran her corn cargo by 100 bushels this week. This is regarded as all the more unusual from the fact that some of the cargo was lightered when she went aground on the trip down, and some waste was occasioned thereby.

Grain transportation charges via the lakes and Erie Canal are now the lowest ever reached, and there does not seem to be a possibility of much of an advance just at present. Wheat is now being carried from Duluth to New York for six and one-half cents, that is for the cost of transportation, and all other charges.

Manager Gordon, of the Great Lakes Steamship Line, is back from a trip to St. Paul. He reports that the new receiving coal dock at Manitowoc will be finished next month. The old one has about 20,000 tons of coal on it, which appears to be the reason why there has been no coal sent there yet this season. The elevator building at Cleveland in the interest of the line will be finished in August.

The Great Northern elevator, which is being built at this port, by President Hill, of the Great Northern Railway and Northern Steamship Co., will be operated by power from Niagara Falls. The elevator will use about 1,250 horse power. There is a war on this week at the Raymond elevator, on account of undue detention, the fact is that too many vessels have recently been consigned to the Raymond and proper dispatch can not therefore, be given.

Edward Smith, as agent of the underwriters, paid to Peter P. Miller \$80,000 in full for the insurance on the lost steamer Florida. But for some error in the proof of loss the insurance would have been paid some days ago. Mr. Smith received in return a letter expressing great satisfaction of the appreciation of the promptness with which the loss had been paid. And this goes far to insure vessel owners in regard to their esteem for those with whom they transact marine insurance business. The sum paid on the Florida and so promptly, too, is no small credit to the favor of insurance agents on the lakes.

Work on the new Pennsylvania and Ohio Fuel Co.'s coal dock at Manitowoc is progressing rapidly. The hard coal shed is to be 460 feet long by 150 feet wide and 50 high. The soft coal storage shed will be 500 feet by 150 feet. The coal dock is to be equipped with the latest machinery, some of which is unique. There will be two towers of steel, one above each shed. Connecting the two, and about sixty feet from the ground will be the transporting cable. The buckets will hold about two and one-half tons each, and can be moved at the rate of 1,500 feet a minute. The Manitowoc Boiler Works will furnish two large boilers, and the entire plant is to be ready for business by the 1st of August.

Final decree and the apportionment of the \$5,000 of salvage money in the case of the Western Transit Steamer Arabia against the G. G. Hadley was made by Judge Lochren at Duluth, Monday. The owners of the Arabia get \$3,500. The master of the Arabia, Capt. Robert Murray, gets \$412.35; the first mate, E. Roberts, gets \$106.25; the second mate, P. D. Dewan, gets \$79.16; Pat Welch, the chief engineer, gets \$147.61; his assistant, George Dolan, gets \$90.96. The deck hands get \$20.58 each; watchman, \$38.05; lookouts, same. The waiters come in for \$33.30, and the porter for \$30.38. Oilers and others of the crew are paid in the same manner, according to the wages they were receiving on the Arabia.

CHICAGO.

Special Correspondence to the Marine Record.

Capt. John Prindiville chartered the steamer Norwalk for oats to Port Huron at 1 cent.

J. A. Calbick & Co. chartered the steamer Kalkaska for corn to Port Huron at 1 cent.

The steamer Bon Ami of the Saugatuck Line arrived here Tuesday, on her first trip this season.

Grain freights were quoted on Tuesday by agents at 1 cent per bushel with more vessels than cargoes, and a falling freight market.

The Goodrich Co.'s splendid twin-screw, steel steamer Virginia is carrying many hundreds of pleasure seekers daily between Chicago and Milwaukee.

H. W. Cook & Co. chartered the steamer Westover and consort Bliss and steamer Charles Reitz for dry lumber Manistique to Chicago at \$1.00 per M. feet, the steamer Katahdin for corn to Buffalo at 18 cents.

The L. M. & L. S. Trans. Co.'s fine steel steamer Manitou will come here from South Chicago this week, and be got ready to start on her first trip this season, on June 24th. She will run tri-weekly between Chicago, Charlevoix, Petoskey, Harbor Springs and Mackinaw.

The side-wheel steamer Chief Justice Waite has been fitted out and inspected and will go into commission at once, carrying excursionists from the lake front to Manhattan Beach during the day and from Clark street bridge out on Lake Michigan for midnight excursions every night.

The steamer City of Kalamazoo of the Williams Line arrived here Tuesday morning, from South Haven, in tow of the steamer H. W. Williams, and was towed to the dry dock. The Kalamazoo has received entire new

cabins, state rooms and upper works and looks as good as new.

The steamer Niko was in dock and received some new bottom plank and a new rudder. This week the steamer Francis Hinton was also in dock for a new wheel, the steamer City of Kalamazoo for some new holding-down bolts and some calking, the schooner yacht Hawthorn for a thorough rebuild, the tug Perfection for repairs to stern bearing and some calking.

Capt. John Barry, of the new tug Rita McDonald, just built at Davidson's shipyard, states that the tug is the most perfect in every department, both hull and power, that he has ever been on, and he has sailed tugs for over twenty years. He is one of the owners of the McDonald and is an engineer and practical machinist. He superintended the placing of the machinery in the tug.

DETROIT.

Special Correspondence to The Marine Record.

The City of Alpena was taken out of dry dock and left for St. Ignace. The City of Mackinac has also left on her first trip of the season.

The keeper of the Thunder Bay Life Saving Station holds 42 barrels and 30 sacks of flour for a claimant. The merchandise is from the wreck of the Florida.

Capt. M. W. Humphrey, manager of the Sulphite Fiber Line of boats, has gone into the commission brokerage business with M. F. N. Potts, in the Majestic building.

James Brodie has been appointed marine superintendent for the Northern Steamship Line, with headquarters at Buffalo. He has previously been mechanical engineer, with headquarters at Duluth.

The protracted rains of the last three weeks have raised the level of Portage Lake three inches and the water is now higher by six inches than last fall. This allows heavier cargoes for Portage Lake ports than ever before.

The steamer Northwest left Duluth on her first trip of the season on Monday, and her sister ship, the North Land, will soon follow. As the D. & C. line has met the reduced rates of the Northern line the latter, it is said, will not benefit by the cut.

The Michigan Wreckage and Salvage Company, of this port, have completed the work of removing the sunken wreck of the schooner Adams by blowing it to pieces, and claim to have left twenty-five feet of water over the ground which the wreck formerly occupied.

It is now believed that the collision suit between the owners of the Florida and the George W. Roby will be settled quietly and taken out of court. Neither side is anxious for the delay and expense attendant on legal proceedings. From the very beginning the parties in the case have shown a disposition to arrange the matter amicably, and appearances indicate that they will be successful.

Contracts for repairs to the crib work, pier and timber work of the skeleton tower at Port Austin reef light station, were awarded as follows: Brick work, Mack Manufacturing Co., Pittsburgh, Pa., \$1,500; cement, H. Houghton, Detroit, \$1,085; dressed stone, Batchelder Wasmund & Co., Detroit, \$531; lumber, F. M. Sibley Lumber Co., Detroit, \$258; metal work, Fulton Iron and Engine Works, Detroit, \$292; subsistence stores, John Blessed & Son, Detroit, \$332.

Many marine people will hear with deep regret of the death of John McGregor, boiler-maker of this port. Mr. McGregor was well along in years, having reached the seventy-eighth mark, and attending to business up till quite recently. Our late esteemed townsman had always a good word for the Record and I among hundreds of others will miss his sterling qualities. One by one, our oldest marine friends are dropping away from their moorings to "cross the river," and we can but wish them a pleasant and glorious harbor on the other shore.

"This talk of the Rockefellers playing hog and putting in boats to carry all the ore in the Lake trade is absurd," said Frank Kirby. "I have figured out that on average carrying capacity the fleet now owned and in process of construction by the Rockefeller interests could not carry eight per cent. of the ore alone, to say nothing of the other freight. Of course, this means figuring the average amount of ore carried during, say, the last ten years. I do not pretend to say just what is the cause of the stagnation in the shipping business, but it certainly is not, up to date, because the Rockefellers are doing it all."

CLEVELAND.

Special Correspondence to The Marine Record.

The D. and C. Line will continue running Put-in-Bay excursions on Sunday.

The steamer Hiawatha of the Gilchrist fleet is fitting out, Capt. J. P. Minsky will sail her.

The revenue cutter Walter Q. Gresham made a short run down the lake Wednesday to adjust her compasses.

The Rockefeller steamer James Watt delivered 5,088 gross tons of ore at Conneaut this week. She reached the dock without trouble.

The schooner Young America, which was tied up at Sandusky Tuesday on a mortgage claim for \$650, was bonded and released next day.

The launch of the Empire City, building at the yards of the Cleveland Ship Building Co., to the order of A. B. Wolvin, of Duluth, will take place on Saturday morning, as duly announced.

The contract for building the new Sandusky bay range

lights, marking the entrance to the harbor, has been awarded to M. Rabbitt, of Toledo, at his bid of \$28,000. The lights, when completed, will be of great advantage to vessels.

It is expected that everything will be in readiness next week to pump out the dry dock of the Cleveland Ship Building Co.'s new plant at Lorain and that the ship yard appliances will be far enough advanced by August 1 to admit of a keel for a ship being laid about that date.

The branch Hydrographic Office in-charge of Lieut. Stafford, U. S. N., is one of the most useful and appropriate institutions ever established at this port. I have heard during the week several cases in which Lieut. Stafford or rather the office, assisted lake seamen in guessing and solving problems which had puzzled them for some time past.

There has been considerable talk here this week about the proposed regulations partly threatened by the government to make all vessels slow down when passing through the dredged channel in Lake St. Clair. Some say that the faster the boats go when in the channel the better it is for the maintenance of the depth, others admit that some rules may be found necessary.

The Cleveland branch Hydrographic Office has received the following notice to mariners from Capt. John Wulke, steamer Tioga: "On June 12, 1897, at 3:10 p. m., 21 miles S.E. from Thunder Bay Island, the steamer Tioga passed a hand pile-driver built on a raft of logs about 8 feet wide, 14 feet long, and 16 feet high. The pile-driver was adrift and directly in the path of passing steamers."

Col. Jared A. Smith, Corps of Engineers, U. S. Army, in charge of this district for the conservancy and improvement of rivers and harbors, has sent out the new rules for the navigation of the Straight Channel at Toledo, and which according to the ruling of the Secretary of War, R. A. Alger, will go into effect from and after July 1, 1897. The actual rules are printed in another page of this issue of the Record.

In the case of William Chisholm and others against the city of Cleveland for damages Judge Sage, in the United States Court has decided in favor of the libelants. The plaintiffs are the owners of the steamer Waldo Avery, which was damaged by passing the Seneca street bridge by the swing of the draw. Damages were asked, \$3,068.05 for repairs, and \$511.08 for delays. The city is held responsible, and a commissioner will effect a settlement.

The Cleveland ship building Co. will launch a large steel steamer from their shipyards at eleven o'clock, Saturday. If the weather is fine a large attendance is assured as this will be one of the biggest boats ever constructed on the lakes and is a representative of the best modern lake-built tonnage. The Cleveland Ship Building Co. is now noted for its excellent work, large capacity and ability to turn out everything in the construction of a steamer from keel to truck.

FLOTSAM, JETSAM AND LAGAN.

The U. S. S. Michigan left Erie this week for Duluth. The Canadian schooners Mowatt and Jamieson brought wheat this week to Buffalo from Toronto for export—an unprecedented event.

May receipts of ore at Cleveland, Ashtabula, Fairport, Conneaut and Lorain were 552,275 tons, against 1,065,844 for the same month last season.

Several pieces of wreckage from the sunken steamer Pewabic were brought this week to Alpena by the steamer H. A. Root. It is difficult to hold the Root in position near the wreck.

The judge advocate-general has decided that the assignment of the Yantic to the Michigan naval militia will not be a violation of the diplomatic agreement with Great Britain, restricting the number of war vessels on the great lakes.

It is stated that twenty shipbuilding firms and private individuals have sent in designs for submarine boats in response to the competition invited by the French Admiralty. The first prize is 10,000 fr. (\$2,000), and the same sum may be divided among five other competitors.

Officers of the Soo canal are investigating a big discrepancy in coal tonnage, which has passed the canal, the amount reported being considerably less than the amount apparently received at the head of the lakes. It is thought that many vessels have given false reports to the canal authorities on account of wrong bills of lading.

Lord Dufferin (late Governor-General of Canada and Viceroy of India) has written for the July Scribner's a paper on the significance of John Cabot's discovery of the mainland of America as related to the dominance of Anglo-Saxon institutions. Lord Dufferin is the chairman of the committee which has in charge the celebration at Bristol, England, of the four hundredth anniversary of that event.

The whaleback steamer City of Everett has been chartered by the United States Navy Department to take a cargo of grain from San Francisco to Bombay. The price to be paid is \$38,500. Owing to the delay in securing a suitable ship the department will not try to charter a steamer to take the cargo of grain from New York as it has been notified that the grain on hand will be sold, and the money forwarded to India, as the best and speediest means of relief.

The Bureau Veritas annual summary of wrecks and casualties for 1896 has been issued in handsome bound form and makes a substantial volume for reference by anyone interested. It gives full particulars not only of wrecks, but of all marine disasters during the year, with dates,

etc., under all flags. The New York agent for the Bureau Veritas is Capt. Albert Spencer, No. 19 Whitehall street, who is always accessible as a maritime encyclopedia of reference.—Marine Journal.

Captain Peter Batchelder will have to stand trial at the January session of the United States district court held in Milwaukee next January, the federal grand jury at Oshkosh having brought in an indictment against him. Captain Batchelder is charged with having endangered government property by maintaining a too great a speed while passing through the ship canal with the tug Sidney Smith last September, with the schooner Penobscot in tow, and which resulted in running down the pile driver.

While the Boston whaling bark Swallow was cruising recently in the South Atlantic, in the vicinity of Tristan de Cunha, a large sperm whale was captured, which yielded, besides considerable oil and bone, nearly eleven pounds of ambergris. The ambergris is in one lump, nearly round and is of a particularly fine quality, being worth in the neighborhood of \$3,500. It is rarely found in the whale as in this instance, being generally picked up floating on the surface of the water. The present market value of ambergris is in the neighborhood of \$300 a pound.

If the American Wrecking and Salvage Co. is successful in raising the cargo of the Pewabic it is likely that it will undertake to do something with the Elbe, which lies at the bottom of the North Sea. The wrecking firm has already had some correspondence with the steamship company upon this subject. George Gardner, one of the directors of the wrecking firm, has confidence that his concern can take the \$500,000 in gold out of the Elbe. Mr. Gardner is not a diver, but he says he has been as deep down in the water as any man, 225 feet in the Smith bell.

A notably practical article on "The Military Value of the Shipyard" has been contributed to the current number of the North American Review by Mr. Lewis Nixon, the well-known naval constructor and designer of the battleships Indiana, Massachusetts and Oregon. "Every shipyard," writes Mr. Nixon, "that can build war vessels capable of sustaining the armor or using the guns and projectiles of our forces against any common enemy becomes a public shield against any and all possible foreign aggression, the value of which to the nation at large and in the long run cannot be computed by the formulas of trade." And it is equally essential to maintain the great armor-making plants of the Union.

Last week's Life had a query "How high should a lady lift her skirts?" and the answer was "A little over two feet." That will serve for an introduction to my story. In Manchester, N. H., years ago, the factory girls determined to go in a body to lay some grievance before the superintendent. It savored of the modern strike. To make an impression, a number of evenings were spent in acquiring a proper style of marching, and they became fairly proficient. The day arrived, and the body of working girls marched in orderly procession to the office, and the superintendent stepped to the door to speak to them. "Close up," said the officer in charge of the girls as they halted. Being somewhat rattled they seized their skirts, lifted them a trifle and were ready to curtsey at the next command.—Weekly Commercial News (San Francisco).

CORRESPONDING SECRETARIES MARINE ENGINEERS' BENEFICIAL ASSOCIATION.

- No. 1, Buffalo, N. Y.; Theo. A. Meyers, 10 Exchange street.
- No. 2, Cleveland, O.; Hy. H. Farr, Cleveland Illuminating Co.
- No. 3, Detroit, Mich.; William Cullen, 19-20 Merrill Block.
- No. 4, Chicago; Geo. Grubb, 1537 George street, (Sta. B.).
- No. 9, Milwaukee, Wis.; C. Forsyth, 659 Milwaukee street.
- No. 27, West Bay City, Mich.; N. P. Slater, 1010 Garfield avenue.
- No. 37, Toledo, O.; E. D. Locke, 1638 Broadway.
- No. 43, Port Huron, Mich.; Geo. Miller.
- No. 44, Manistee, Mich.; Christ. Dahl, 534 W. Second.
- No. 46, Clayton, N. Y.; Lewis A. Kenyon.
- No. 47, Sault Ste. Marie, Mich.; Peter Kelley, Box 31.
- No. 48, Sandusky, O.; John Irving, 1510 Monroe street.
- No. 51, Muskegon, Mich.; Jas. Cummings, Hackley Bank Building.
- No. 53, Marine City, Mich.; Harry Stone.
- No. 55, Cheboygan, Mich.; Charles Adams.
- No. 67, Saugatuck, Mich.; Wayne Coats.
- No. 72, Oswego, N. Y.; Thomas Navagh, 40 Lake street.
- No. 73, Green Bay, Mich.; E. B. Kellogg, 711 Walnut street.
- No. 75, Alexandria Bay, N. Y.; A. J. Thompson.
- No. 76, Grand Haven, Mich.; Orson Vanderhoef.
- No. 77, Manitowoc, Wis.; John A. Flint, 818 Jay street.
- No. 78, Duluth, Minn.; F. B. Barrows, 1128 E. Third.
- No. 85, Alpena, Mich.; Arthur J. Irwin, 427 Washington avenue.
- No. 86, Marinette, Wis.; Alfred A. Larson, 1114 Carpenter street, Menominee, Mich.
- No. 87, Detroit; Geo. B. Milne, 503 Commonwealth avenue.
- No. 88, Sturgeon Bay, Wis.; C. O. Chapman (S. B. Canal).
- No. 89, Ogdensburg, N. Y.; C. E. Davidson, 29 Congress street.
- No. 91, Ashtabula, O.; Martin Joyce, 8 Spruce street.

No. 92, E. Saginaw, Mich.; Harry E. McArthur, 17 McCormick Building.

No. 95, Port Clinton, O.; Geo. A. Semon (care of S. T. Collins).

No. 102, S. Haven, Mich.; Chas. La Bounty.

NOTICE TO MARINERS.

The lighthouse board on Wednesday gave notice that on July 10, a fixed red light of the fourth order will be established in the structure recently erected on the southwestern point of South Bass Island, westerly part of Lake Erie.

The focal plane of the light will be 60 $\frac{1}{2}$ feet above mean lake level and about 40 feet above the base of the tower. The light will be visible about 13 miles in clear weather. The light will illuminate 315 degrees of the horizon, the dark angle lying between S. by W. 1-8 W. and SW. by W. 1-8 W. (bearings from a vessel), but in general the light will not be visible to the eastward of S. 5-8 E. nor to the northward of WSW. 1-8 W., owing to trees on the island.

The light will be shown from a black lantern surmounting a square red brick tower projecting from the southwest corner of a square, two-story, red brick dwelling with slated roof. Bearings and distances of prominent objects are: Starve Island reef buoy SE. 3-8 E. 1 3-4 miles; West Sister Island lighthouse, NW. by W. 1-2 W., 16 miles; Green Island lighthouse, NW. 3-8 W., 1 3-4 miles.

In approaching from the eastward, keeping Green Island open to the southward of this light will guide clear of the southerly extremity of Starve Island reef.

MARITIME LAW.

VAN DEN TOORN vs. LEEMING et al.

(Circuit Court of Appeals, Second District, Feb. 23, 1897.) General Average—When Allowed—Repair of Cracked Shaft—Subsequent Breakdown.

A steamship bound for New York discovered a crack in her shaft when about 316 miles from Sandy Hook. The shaft was strengthened by bolts, and she proceeded at reduced speed until 16 miles from Sandy Hook, when the shaft broke and greatly damaged the machinery. Contribution was claimed on the ground that the risk to the ship was foreseen, and deliberately undertaken in order to save the ship and cargo the great expense of towage. The evidence showed, however, that, while the officers recognized the possibility of a new breakdown and further damage, they confidently believed that it could be avoided. Held, that there was no such voluntary sacrifice of the ship to save cargo as was necessary to make a case of general average. 70 Fed. 251, affirmed.

Appeal from the District Court of the United States for the Southern District of New York.

This was a libel in personam by William H. Van Den Toorn, as agent and trustee, against Thomas Leeming and another, to enforce contribution in general average from defendants as consignees of certain cargo shipped on board the steamship Schiedam. The district court rejected the main item of damage for which contribution was claimed (70 Fed. 251), and the libelant has appealed.

Before Wallace, Lacombe and Shipman, Circuit Judges.

SHIPMAN, Circuit Judge. The libelant, in behalf of the steamship Schiedam, filed a libel to recover from the respondent \$1,158.90, as the contribution from their part of the cargo for general average expenses incurred by the ship. The district court decreed payment of \$181.21, which was the amount admitted to be due after the rejection of the damages which were held not to be properly included in general average. From this decree the libelants appealed.

The facts of the case are succinctly stated by the judge of the district court, as follows:

"The above libel was filed to enforce the payment of general average contribution against one of the consignees of cargo on board the steamship Schiedam, which arrived in this port from Rotterdam on July 14, 1891. When 316 miles to the eastward of Sandy Hook, on the evening of July 10th, between half past seven and eight o'clock, a crack 18 inches long was discovered on one side of the main shaft, mostly inside of the after bearing, and about two feet from the crank. This was temporarily repaired during the 24 hours following by drilling the shaft which was 14 $\frac{1}{2}$ inches in diameter, and inserting two iron bolts, 11 inches long and 18 inches in diameter across the line of the crack. The ship then proceeded on her voyage at about three-fourths of full speed (making 37 or 38 revolutions per minute, instead of 50 to 52 full speed), without interruption, for 38 $\frac{1}{2}$ hours, to within about 16 miles of Sandy Hook Lightship, when, after having thus made about 300 miles, the shaft suddenly broke wholly off at about 10 a. m. of July 13th, at the original place of fracture. The fractured parts, riding each other, carried away the bearings, damaged the bed plate and channel way, and did much other injury to the machinery. At about 2 p. m. of the same day the ship was taken in tow by a tug and reached Quarantine, at Staten Island, at 9 p. m. For this latter service \$1,000 was allowed as salvage compensation. The Schiedam, 48 Fed., 923. A general average account was afterwards adjusted, amounting in all to \$17,508.65. In this charge was included, not only the expense of the towage last named, with other items concerning which there is but slight difference, but also charges to the amount of \$13,000 on account of the damage done to the vessel and machinery by the last violent breakdown

of the shaft. No charge was made for the cracked shaft itself, nor for any injury supposed to have been done to the bearings before the repair to the shaft was made."

The only matter in controversy was the liability of the cargo to pay its proportional part of the damage to the ship which resulted from the final break of the shaft. The claim for general average was founded upon the alleged fact that the risk of a great injury to the vessel was foreseen, and was deliberately undertaken in order to protect the cargo and ship from the large salvage expenses which would be incurred if towage was accepted as an alternative, and that thus the consequences of the final breakdown were a sacrifice voluntarily undertaken for the benefit of cargo and vessel.

The principles which are at the foundation of general average were elaborately discussed before the Supreme Court in the cases of Barnard vs. Adams, 10 How., 270; Dupont de Nemours vs. Nance, 19 How., 162; and in the Star of Hope, 9 Wall., 203. In the first named case, the court announced with precision, the three things which must concur "in order to constitute a case for general average," which can be summarized as follows: (1) A common imminent danger, to be overcome by voluntarily incurring the loss of a portion of the whole to save the remainder; (2) a voluntary casting away of some portion of the joint concern for the purpose of saving the residue; (3) the attempt must be successful. The controversy in this case is not in regard to the principles which are applicable to it; but it is whether the facts are those which ought to exist in order to create a case for general average. We say "ought to exist," for it is worthy of note that the tendency of modern adjustments is to enlarge the boundaries of expenses which are included in the adjustment. The question of fact is whether there was, at the time of the repair of the shaft, and the decision to proceed to New York under the vessel's steam, a voluntary, expected sacrifice of anything; whether there was even a decision to enter upon a peril to the ship; or whether it was the usual case of repair, in the belief that the port of destination, 316 miles distant, could be reached in safety. Upon this point we fully concur in the conclusion of the district judge that:

"The evidence going to show any expected sacrifice on the part of the ship or an expectation of such damage as actually happened, is not as strong or as convincing as is stated in the libelant's argument. The evidence hardly shows more than the recognition of a possibility of injury, but with a confident expectation that any breakdown would be avoided."

The testimony of the chief engineer, who was presumably, the officer most conversant with machinery, is significant. In reply to the question by the counsel for the libelant, "Why was it that you decided to make these unusual repairs, and take these risks of proceeding under your own steam, instead of taking a tow?" he said: "In the first place, I knew that I could make the repairs, and that it could do the work, as was evident by its going 300 miles. And in the second place, it was for the purpose of saving the expense of being towed." Both the captain and the engineer knew the possibility of a new breakdown, and the probabilities of further damage if the renewed break occurred; but that their decision amounted to a determination to sacrifice the vessel, if need be, in order to save towage, does not seem to have occurred to them. The efficiency of the repairs was not as lasting as the engineer had expected, for an injury to the ship subsequently happened; but this unsuccessful result does not entitle the ship to classify the use of the machinery and its injury, after a repair which was entered upon without foreboding, as a voluntary sacrifice for the purpose of rescue from a common danger. Our attention has been called to the provisions of the seventh York-Antwerp rule, as indicating the recognition of the principle that the damages to the machinery of the Schiedam should be allowed. The rule is as follows:

"Damage caused to machinery and boilers of a ship, which is ashore and in a position of peril, in endeavoring to refloat, shall be allowed in general average, when shown to have arisen from an actual intention to float the ship for the common safety at the risk of such damage."

The circumstances to which that rule is limited did not exist in this case. The decree of the district court is affirmed with costs.

ARMOR PLATES.

The Navy Department has made an interesting test at Indian Head proving grounds to determine the efficiency of two thin armor plates superimposed on each other in close contact, as against the resisting power of a single plate of their combined thickness, the result demonstrating to the satisfaction of the Department that the single thick plate is a considerably more effective barrier against armor piercing shells with service charge than the two thin plates. The experiment was made for the purpose of determining whether in case the emergency should arise it would be practicable to provide certain armor for the three new battle ships by having thin plates made to be used in lieu of the thick plates. The thin plates, it was decided, could be manufactured by any one of a considerable number of steel makers and could be produced in large quantities at short notice. All experts who witnessed the test unite in the opinion that the superimposed plates proved much less efficient than single plates of their combined thickness, made under similar conditions and heretofore tested under equivalent specifications.

LAWS AND REGULATIONS FOR TOLEDO.

USE AND NAVIGATION OF THE CHANNEL.

Definition.—The Straight Channel comprises the channel proper, its improved approaches at either end and such channel banks, dikes, piling or other works as are now or may hereafter be constructed in connection therewith.

The custodian of the channel, either by himself or through assistants, may direct the movements of all vessels, boats, rafts and other floating things in the channel, and of all persons upon the works connected therewith. The directions, orders and instructions given by him or his assistants to regulate the movement of any vessel, boat, raft or other floating thing in the channel shall be obeyed by all persons in charge of or employed upon said vessel, boat, raft or other floating thing, and by each and every person upon the works connected therewith.

All persons in charge of, or employed upon vessels or boats are forbidden to throw anything into the channel or to cause or permit their respective vessels. To land at, push into, or tie up to the banks, unless on government business. To enter the channel two or more abreast. To pass another vessel or boat while going in the same direction in the channel, except as specified in the Pilot Rules issued by the Board of Supervising Inspectors of steam vessels. To pass the channels in more than one line going each way. To obstruct the channel in any way, or to intentionally delay, by slow passage through the

All persons are prohibited from willfully or carelessly injuring or damaging any of the works pertaining to the channel and from tying up to any of them (except upon government business), whether it be buoys, cribs, pile work, dikes or any other work connected with the channel.

In case of any boat, vessel, or other craft or raft sinking or grounding in the channel or otherwise obstructing it, the officer or agent of the United States, in charge of the channel, shall have the right to take such possession of such vessel, boat, or other craft, as shall be necessary for the purpose, and remove it, and clear the channel of the obstruction caused by it, and no one shall interfere or prohibit him from doing so, or do anything that will tend to interfere with or prohibit him from doing so: Provided, That the officer, or agent of the United States may, in his discretion, give notice in writing to the owners of any vessel, boat, or other craft, or raft, obstructing the channel as aforesaid:

The foregoing rules and regulations for the administration, use and navigation of the Straight Channel through Maumee Bay, Toledo, Ohio, shall have full force and effect from and after July 1, 1897. R. A. ALGER,

Secretary of War.

tralia, also for case oil to the far East and for timber from the Gulf to Europe, whilst there are some signs of returning activity in the lumber trade to South America, and we hope to see a fair demand in this line before long. Naval-store freights, on the other hand, continue low and neglected, and the barrel oil trade to Europe is likewise slow and rates without material change.

SEAMLESS DRAWN BRASS AND COPPER TUBES.

In the interests of their special manufacture, seamless drawn brass and copper shells and tubing, the firm of Randolph & Clowes, Waterbury, Conn., have just issued a neat booklet entitled "Touching a Tubular Triumph."

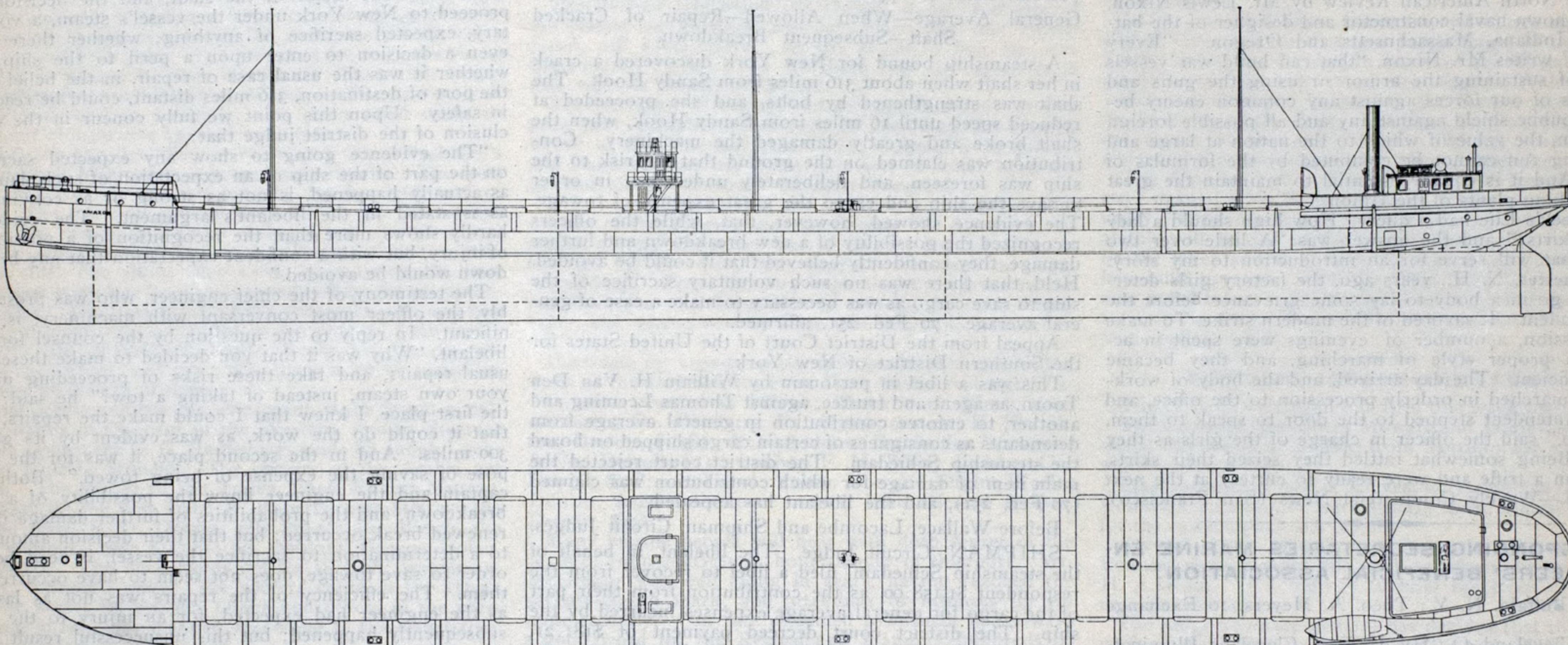
The above firm is a representative industry of the country in brass and copper goods and its business methods together with the able practical management of the extensive plant is commendable from every standpoint. The merited and marked success of the company amply bear out such a statement as the foregoing.

In admiring the contents of the booklet, which is of course issued for trade purposes, we cull the following trenchant paragraphs.

"The secret of America's marvelous advance in the mechanic arts, if indeed secret it be, must be looked for in certain conditions inherent in its people. Throughout the length and breadth of our land, and entering into every branch of manufactures, there exists a never slum-

VESSELS CLASSED.

We note that the following vessels have been classed and rated during the past week by the American Ship



PLAN OF THE STEEL SCHOONER POLYNESIA.

Built by the Globe Iron Works Co., Cleveland, to the order of James Corrigan and others. Launched June 12th, 1897.

channel or by any other means, the progress of other vessels or boats navigating the same. To hug the channel banks in passing, or to deviate more from the middle of the channel than is necessary for safe navigation. To pass the channel at a rate of speed exceeding eight miles per hour.

No one in charge of or employed on a sailing vessel shall cause or permit such vessel to beat through the channel. He shall tow the vessel through or wait for a fair wind in daylight.

No one in charge of or employed on a vessel however propelled shall cause or permit such vessel to pass through the channel with its sail or sails up unless it be a sail vessel running with a fair wind in daylight. During the hours from sunset to sunrise sails shall not be hoisted on any vessel.

No raft shall be towed through the channel without a tug at the stern of the craft to control it, so that he channel may be obstructed as little as possible.

No tow shall enter or pass through the channel with a tow line more than two hundred (200) feet in length.

To prevent blockades in the channel or its approaches, the custodian of the channel is authorized to detain any vessel at either end thereof until in his opinion a safe passage can be secured; and no one shall do anything to interfere with or prohibit his doing so, or anything that will tend to or is likely to interfere with or prohibit his doing so.

masters' Association, New York, in the Record of American and Foreign Shipping:

American screw steamer, Manteo; screw pilot boat, New York; barge Pilgrim, and the four-masted schooner, W. Wallace Ward.

EASTERN FREIGHT REPORT.

The eastern freight report furnished the Marine Record by Messrs. Funch-Edye & Co., steamship agents and brokers, New York, states that the demand for grain cargoes during the present week shows a further shrinkage compared with the preceding one, and general business has moved on similarly contracted lines. The list of vessels closed for timber from the Gulf and for deals from the Provinces, on the other hand, is an unusually heavy one, and the fact that freights have been fairly well maintained, speaks well for the momentary position of these trades. The great rush of cargo for this continent, in anticipation of the tariff changes, has come to an end, and the consequent falling off of seeking boats promises us a somewhat steadier freight market in the near future, although no decided advance can be expected before a better demand for our cereals sets in.

Our market for sailing vessels remains quiet but firm, and the continued scarcity of tonnage, both on spot and to arrive, encourages the hope for better rates. There is more inquiry for vessels to load general cargo to Aus-

tralia, also for case oil to the far East and for timber from the Gulf to Europe, whilst there are some signs of returning activity in the lumber trade to South America, and we hope to see a fair demand in this line before long. Naval-store freights, on the other hand, continue low and neglected, and the barrel oil trade to Europe is likewise slow and rates without material change.

"How can I improve on it? Is the "strange device" emblazoned on the banner that is nailed to the masthead of America's productive industries and beneath that banner rally forces that in the last five brief decades have simply astounded all the dwellers upon earth. One specially notable result of this unquenchable thirst for improvement will be found in the fact that supply is not only ever abreast of demand, but, as a rule, noticeably in advance of it, and a tendency to first create a commodity and afterward a clientage, is an important factor in our forward strides toward commercial supremacy.

PRACTICAL METHOD FOR FINDING COMPASS ERRORS.

ARRANGED FOR MASTERS AND PILOTS ON THE GREAT LAKES.

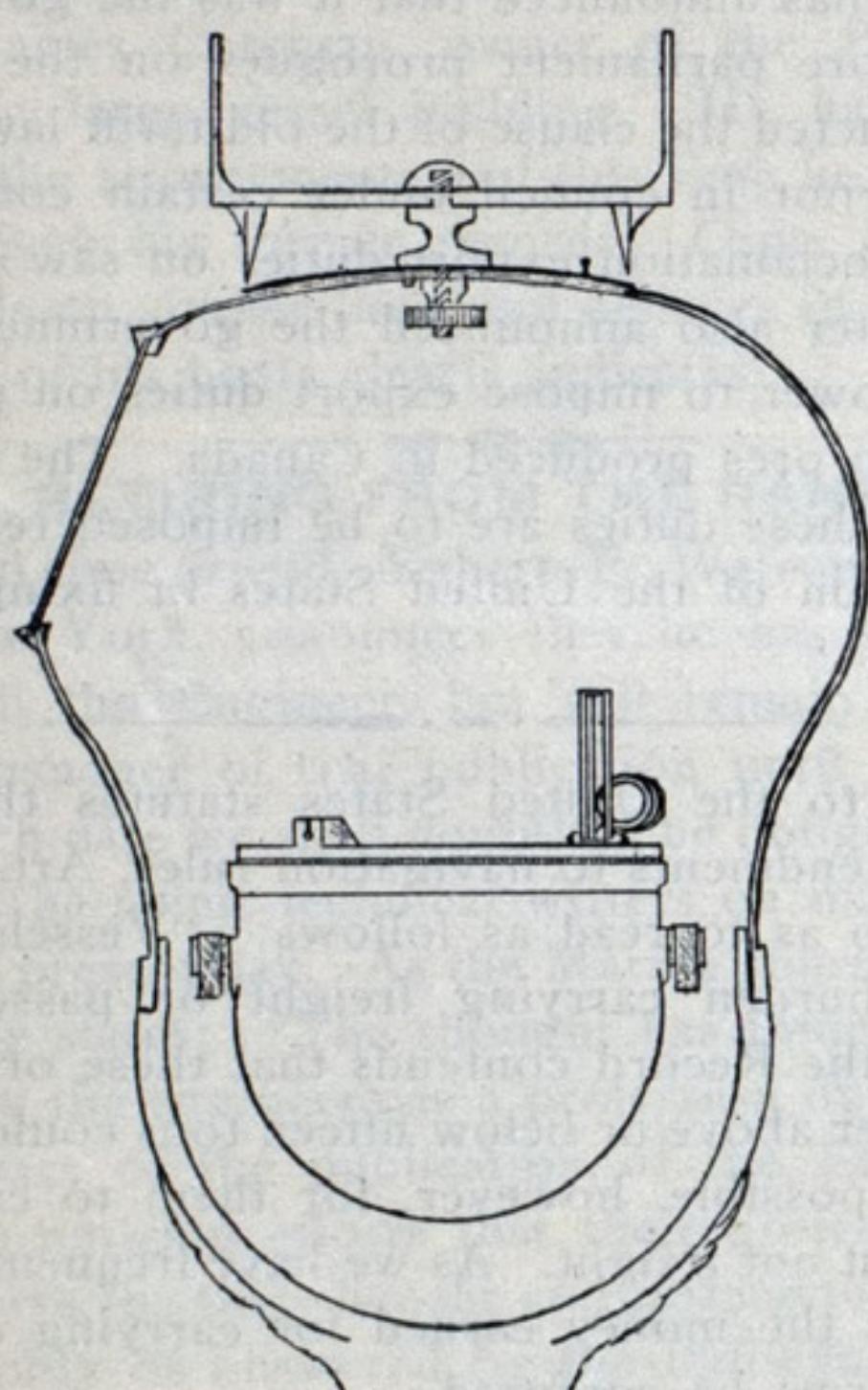
BY JOHN ROSS, LATE MASTER LIGHT-HOUSE TENDER 9TH. DISTRICT.

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CHAPTER IV.

THE AZIMUTH CIRCLE.

To find the compass error it is necessary first, to be able to take a correct bearing by the compass. The most simple and best instrument for this purpose is the azimuth circle (see plate); it consists of a brass or bronze circle fitting the top of the compass bowl so as to turn smoothly and evenly in every direction. On one side it has a sight-vane with a hair line sight stretched perpendicularly and on the opposite side an eyepiece through which the hair-sight and the compass reading can be seen. On the sight-vane there are also colored glass screens, to shade the sun or reflected glare on the water; if azimuths of heavenly bodies are taken the sight-vane is also fitted with reflecting glasses; both the colored glasses and reflecting glasses can be turned so as not to interfere when it is desired to take a direct, uninterrupted bearing. There are a number of patterns on the market, some good, others indifferent; my advice is to get the best, and one with which the bearing can be easily and plainly read.



When under way the azimuth circle should be kept shipped on the standard compass and swung so as not to interfere with the binnacle lights or the lubber's mark on the compass; the circle no matter how it is turned, should not disturb the level of the compass bowl. Before using, it should be examined to see if the compass can be easily read through the eye piece and any moisture or dust which may obscure the reading be removed.

Like all other instruments it should not be handled by incompetent or careless members of the crew, as a knock against any hard substance is liable to put it out of adjustment.

FINDING THE COMPASS ERROR BY RANGES.

The method for finding the compass error by a range of two objects some distance apart, and of which the magnetic bearing is known, is undoubtedly the most simple of all known methods and one that recommends itself to Lake pilots because it requires less computation and preparation than others. Proficiency in taking bearings correctly and a knowledge of the magnetic bearing of the range are all that is required. With a little practice anyone should be able to make the necessary observations to construct a deviation table and curve and keep them corrected.

The range should be two fixed objects on shore, the greater their distance apart the better, such as two light-houses several miles apart, or a light-house on a breakwater or pier and some object on shore several miles distant; these are the best ranges. Good bearings may be taken on ranges where the objects are a half mile, or less apart, but in this case the vessel must be either head or stern on to the range, or else running very slow; it is

always preferable when using a range taken from the charts to have the objects from 2 to 6 miles apart and both plainly visible.

On some charts chimneys, spires, prominent buildings, etc., are shown which in many cases can be utilized for ranges by the navigator, who can take the true bearing from the chart and apply the variation (taken from the Pilot Chart) so as to get the magnetic bearing of the range.

The following example will explain the proceeding necessary for the construction of a deviation table.

Suppose the true bearing of Cleveland breakwater (east end) light-house in range with a prominent chimney in the city is S. 15° W. and it is known that the variation in this locality in 1897 is 1½° westerly. To find the magnetic bearing of the range this 1½° of westerly variation is applied to the right of the true bearing making the magnetic bearing of the range S. 16½° W.

Note.—A correct magnetic bearing of the range must be obtained. In case an incorrect variation is applied to the true bearing to get the magnetic bearing the deviation table will have an even and constant error by the amount that the applied variation is wrong.

Before commencing the observations for the compass error a table similar to table I, should be ruled; the first column in this table may be filled in before the observations, and columns 2, 3, 4 and 5 should be filled in during observation; column 5 may, however, be filled in later.

The vessel should be far enough out from the front object of the range to have room and a depth of water sufficient to manoeuvre and stand across the range on every point of the compass. The vessel should be on an even keel and the water should be smooth so that rolling will not interfere with the observer, or the heeling error enter

After the vessel has crossed the range she should be kept far enough over so as to be turned and steadied on an opposite course across the range. Having turned the vessel and steadied her on an E. by S. course by the standard compass, repeat the operation as before. The next time the vessel crosses the range let it be on a W. NW. course and reverse this course coming back. Take a careful bearing on each course as the vessel crosses the range on that course and enter it in column 2 in the table, which has been prepared for this purpose, as soon as it is taken. If the masts or smokestack interfere with bearings on certain courses, select another range of which the magnetic bearing is known; cross this range with the vessel heading the courses for which no bearings could be taken on the first range; enter the bearings taken on the second range in column 2 of the table and abreast of them in column 3 enter the magnetic bearing of the second range so that they can be distinguished from the magnetic bearing of the first.

After a bearing has been taken and entered in column 2 of the table, compare it with the magnetic bearing of the range on which the bearing was taken. If the magnetic bearing is to the right of the compass bearing the deviation is easterly by the amount the bearings differ; if the magnetic bearing is to the left of the compass bearing the deviation is westerly by the amount that the bearings differ.

For example, when standing on the W. by N. course the bearing of the range, taken with the standard compass is S. 22° W. The magnetic bearing of the range is known to be S. 16½° W., which is 5½° to the left of the compass bearing; therefore on a W. by N. course the compass has 5½° westerly deviation, or nearly half of a point. On the E. by S. course the bearing of the range, taken with the standard compass, is S. 11½° W., and as the magnetic bearing is S. 16½° W., or 4½° to the right of the compass bearing, the compass has 4½°, or nearly half point easterly deviation.

As before stated, a little practice only is required to make the observer expert at taking correct compass bearings with a good azimuth circle. If the compass is properly mounted and the vessel is kept on the courses long enough to have steadied the compass card (about 3 minutes) when the bearings are taken, a reliable deviation table is the result.

The increase or decrease in the deviation from one point of the compass to the next, should be fairly regular. If there is any very marked increase or decrease on any one point the bearing on this point and the adjacent points should be taken a second time, to ascertain if any mistake was made in the first bearings observed.

Having filled in the four columns in the table with the ship's head by standard compass, the bearing of the range by standard compass, the magnetic bearing of the range, and the deviation of the standard compass, to fill in the fifth column, or, in other words, to obtain the magnetic heading of the vessel on every point of the standard compass—apply the easterly deviations to the right of the compass headings (column 1) and westerly deviations to the left of the compass headings. The table will show what the magnetic heading of the vessel will be when heading on any point of the compass.

It is found, however, more convenient to have a table from which the navigator can, without trouble, take the compass course he wants to steer to make good a known magnetic course.

If the largest deviations are not more than 5 degrees (about half point) and their increase or decrease is fairly regular, the deviations may, in practice, be applied directly to the magnetic points; in this case easterly deviations must be applied to the left and westerly deviations to the right of the magnetic course to obtain the compass course—just the reverse of applying the deviations to the compass course to obtain the magnetic course.

The following table (2) illustrates the conversion of the table (1). If the deviations are more than 5 degrees, or increase and decrease irregularly, the deviation curve should be drawn on Napier's Diagram; from this a table can readily be made. In any case, the diagram will be found more convenient.

TABLE 2.

Steamer..... Standard Compass.
Cleveland, O., April 15, 1897.

(1) Ship's Head by Standard Compass.	(2) Bearing of Range by Standard Compass.	(3) Magnetic Bearing of Range.	(4) Deviat'n of Standard Compass.	(5) Magnetic Heading.
North.	S. 16½° W.	S. 16½° W.	½° W.	North.
N. by E.	S. 15½° W.	"	¾° E.	N. by E.
NN.E.	S. 15½° W.	"	1½° E.	NN.E. ½ E.
NE. by N.	S. 14° W.	"	2½° E.	NE. ¾ N.
NE.	S. 13° W.	"	3½° E.	NE. ¼ E.
NE. by E.	S. 12½° W.	"	4½° E.	NE. by E. ¾ E.
E.N.E.	S. 11½° W.	"	5½° E.	E.N.E. ½ E.
E. by N.	S. 10½° W.	"	5½° E.	E. ½ N.
E.	S. 11½° W.	"	5½° E.	E. ½ S.
E. by S.	S. 11½° W.	"	4½° E.	E.S.E. ¾ E.
E.S.E.	S. 12° W.	"	4½° E.	SE. by E. ¾ E.
SE. by E.	S. 12½° W.	"	4° E.	SE. by E. ½ E.
SE.	S. 13½° W.	"	3° E.	SE. ¾ S.
SE. by S.	S. 14½° W.	"	2½° E.	SSE. ¾ E.
SSE.	S. 15° W.	"	1½° E.	S. by E. ¾ E.
S. by E.	S. 15½° W.	"	½° E.	S. by E.
South.	S. 16½° W.	"	½° E.	South.
S. by W.	S. 17½° W.	"	½° W.	S. by W.
SSW.	S. 17½° W.	"	1¼° W.	S. by W. ½ W.
SW. by S.	S. 18½° W.	"	2° W.	SSW. ¾ W.
SW.	S. 19½° W.	"	2½° W.	SW. ¼ S.
SW. by W.	S. 19½° W.	"	3½° W.	SW. ¾ W.
WSW.	S. 20½° W.	"	4° W.	SW. by W. ½ W.
W. by S.	S. 21½° W.	"	4½° W.	WSW. ¾ W.
W.	S. 22° W.	"	5½° W.	W. ½ S.
W. by N.	S. 22° W.	"	5½° W.	W. ½ N.
WNW.	S. 21½° W.	"	4½° W.	WNW. ¾ W.
NW. by W.	S. 20½° W.	"	4° W.	WNW. by W. ¾ W.
NW.	S. 19½° W.	"	3° W.	NW. ½ W.
NW. by N.	S. 18½° W.	"	2½° W.	NW. ¾ N.
NNW.	S. 18° W.	"	1½° W.	NNW. ¾ W.
N. by W.	S. 17½° W.	"	¾ W.	N. by W. ¾ W.

into the observations. Examine the azimuth circle to see that it works smoothly and can be easily read, and have a good helmsman at the wheel, as special care must be exercised to keep the vessel perfectly steady on the courses. It is advisable to have one of the vessel's officers stand near the standard compass to steady the helmsman, so as to leave the observer free to attend only to the observations.

The vessel now being far enough out from the range not to close it too quickly and about one-half to three-quarters of a mile on one side, say to the eastward, of it, put her on a W. by N. course by the standard compass and steady her on the course, going at a speed of about 4 to 5 miles; in any case, the vessel should be steady on the course about three minutes before crossing the range. The observer should then sight through eyepiece of the azimuth circle, moving it slowly and evenly while the hair sight is kept on the back object. As soon as the hair sight, the front object and the back object are in range (as seen through the eyepiece), take hands off the circle and read the bearing in degrees as indicated by the hair sight on the compass. The vessel should be kept steady on the course until the bearing has been read from the compass.

MAGNETIC COURSE.	DEVIATION.	COMPASS COURSE.
North.	½° W.	North.
N. by E.	¾ E.	N. by E.
NN.E.	1½ E.	NN.E. ¾ E.
NE. by N.	2½ E.	NE. ¾ N.
N. E.	3½ E.	NE. ¼ E.
NE. by E.	4½ E.	NE. by E. ¾ E.
E.N.E.	5½ E.	E.N.E. ½ E.
E. by N.	5½ E.	E. ½ N.
East.	5½ E.	E. ½ S.
E. by S.	4½ E.	E.S.E. ¾ E.
E.S.E.	4½ E.	SE. by E. ¾ E.
SE. by E.	4 E.	SE. ¼ E.
SE.	3 E.	SE. ¾ S.
SE. by S.	2½ E.	SSE. ¾ E.
SSE.	1½ E.	S. by E.
S. by E.	¾ E.	South.

From this table a given magnetic course can readily be converted into a compass course.

(To be continued.)



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COLLISION IN HARBOR.

It would appear from all the "Rules of the Road" known to us that a steamer should keep clear of a sailing vessel. The steamer has power under usual conditions to do so.

This week Judge Grosscup, of Chicago, has ruled to the contrary and avowed, rendered his decision and committed himself to the theory that a steamer is not to blame for sinking a sail vessel even while quietly tied to the dock in port.

Judge Grosscup evidently ought to read up in marine law or not allow himself to be carried away by the arguments of counsel. We expect equity and justice at the hands of our admiralty courts and from the plain facts of this case, published in another column of the Record, such has not been rendered in the suit between the steamer "Naples" and the schooner "Sheboygan."

Let a schooner or any other vessel be laying at her moorings, say in a harbor of thirty miles circumference or diameter, another vessel comes in and gives her a foul berth, the result is a foregone conclusion. How much more so when a schooner is tied up to a dock and a steamer almost deliberately sinks her through lack of judgment, insecure moorings, lines, fastenings, or what not.

The plain facts of the case are that the Naples was not securely moored, hence, all errors or damage arising therefrom, are clearly ascribable to her negligence in not being properly moored or taking precautions to be so before the storm set in. It matters not that her wheel chains parted afterwards or had any other incident occurred, the ship was insecurely moored, was a menace to other property, and deserved to be maimed in the penalty therefor, otherwise we do not read the decision aright.

We have not the brief before us, nor the arguments of counsel given, or testimony offered on each side, but the judgment as rendered in this case by the court seems to be at loggerheads with all known precedents and custom.

We have frequently been in a position to endorse and highly appreciate the decisions of Judge Grosscup, but this rendering of the case in question makes us query the courts level-headedness, notwithstanding the casualty with the judgment relating thereto has been affirmed by the Court of Appeals.

ERIE CANAL IMPROVEMENTS.

The Donnelly Contracting Co.'s work on the Erie Canal, was inspected a few days ago by Deputy State Engineer Roberts, General Inspector Tubbs, Division Engineer Little and Resident Engineer Neher. They expressed them-

selves as being well satisfied with the character and the progress of the work.

The portion covered by the Donnelly Co.'s contract is the four miles of canal and of slips forming the western end of the Erie Canal through the city of Buffalo; the main work was the deepening of the canal by the excavation of two to three feet of rock and hard-pan, over nearly this whole length, and by the removal of the earth, and mud, and filth, which had washed into the Canal to so great an extent that in some places the excavation was eight feet in depth.

The purpose of the improvement was to make nine feet below the extreme low stage of Lake Erie, of which this section is practically a part; the water standing in it when in use at the same level as in the lake, and rising and falling with the lake, whose average level is 572 feet above mean tide at New York, while the new Canal bottom is here made at 560 feet above the same point, or twelve feet below the average lake level.

In the meantime the canal boats which are loaded every day at the Buffalo elevators and are bound for New York, are towed, free of cost to the boatmen, down the Niagara river (four miles) to Black Rock, where they enter the canal, and the west-bound boats are towed up to Buffalo in the same way; so that boatmen are not suffering by the delay, by the results of which they will profit when the work is completed.

The Donnelly Contracting Co. has come to be recognized as one of the most prominent contractors on Lake works, and they but recently completed a large contract at the Sault Ste. Mary Canal; they have now in progress another large government work at Dunkirk harbor, in addition to the Erie Canal work. The firm consists of James B. Donnelly, president; Elliott B. Mott, vice-president, and William P. Donnelly, secretary and treasurer. The superintendent of the operations on their various works is Mr. Wilson E. Skinner. Mr. William Pierson Judson has been engineer-in-charge of their canal work at Buffalo, since May 1st.

LIGHT SHIPMENTS OF ORE.

The light movements of ore up to date is plainly shown by the small receipts at ports in the Cuyahoga district, which are the leading ore receiving ports on the lakes. For the month of May the receipts show a falling off of almost one-half, compared with May, 1896. In May, 1896, Cleveland received 493,543 tons of ore, which is within 60,000 tons of the total receipts for all the ports in the district for the last month. Receipts at Cleveland, Ashtabula, Fairport, Conneaut and Lorain for last month were only 552,275 tons, against 1,065,844 for May, 1896, according to custom house figures.

Receipts of ore at ports in the district for 1896 and 1897 follow:

Ports.	1896.	1897.
	Tons.	Tons.
Cleveland	493,543	182,727
Ashtabula	384,265	248,929
Fairport	116,085	87,374
Conneaut	28,911	27,200
Lorain	43,040	6,045

Cleveland shows the greatest falling off and Conneaut is over 1,000 tons behind last year. Ashtabula leads in receipts of ore, with 248,929, and Cleveland is second, with 182,929 tons. Although it has been impossible to get cargoes for all the boats, shipments of coal from ports in the district for the month of May show a gain over the same month last year: Past month 290,994 tons of coal were sent forward, compared with 252,470 tons for May, 1896, Cleveland leads, with 189,760 tons, and Ashtabula is second, with 64,856 tons.

Although the industry is in none too flourishing a condition judging from the foregoing we now learn that Senator Quay has proposed an amendment to the tariff bill now under consideration in the senate, providing that Americans who own iron mines in foreign countries may bring in the ore from these mines free of duty if it is for their own use and not placed on the market for sale.

The object of the proposed amendment is to allow the Americans who are interested in furnace and steel plants on the Atlantic coast, and who some years ago obtained control of iron properties in Cuba which they have since partially developed, to obtain their ore supplies in Cuba, so far as that may be done advantageously, without being handicapped as they now are by the duty of forty cents a ton on imported ore. The effect of this would be to give

such furnaces a very great advantage over their competitors, for the latter could not obtain foreign ore without paying the duty on it. The furnaces whose owners also own Cuban iron properties would be thus enabled to make even lower prices than now prevail on iron. Competing furnaces would be obliged to meet the cut at the cost of labor, and thus would come a further squeeze for the men employed in American mines and in the transportation and handling of ore between the mines and the furnaces.

The sundry civil appropriation bill has at last become a law by the signature of the president, and the sum of \$437,500 is available for the improvement of the Superior-Duluth harbor this year. It will be several weeks before the money will be actually available for use, but in the meantime work has been commenced by the contractors on a small scale. It is probable that all this sum will not be used this season, and that there will be enough left over to commence operations next season. Next year the contractors will have to commence work in earnest and will probably be required to move about 5,000,000 yards of dredging, or about one-fourth of the contract. Thus the work of improving the harbor at the head of the lakes on a large scale has finally been commenced. When completed Superior-Duluth will have one of the finest natural harbors in the United States, if not in the world.

As a result of the request of a large deputation of lumbermen, bankers and transportation companies that waited upon the government a few days ago, the Canadian minister of finance has announced that it was the government's intention before parliament prorogues on the 19th inst. to have re-enacted the clause of the old tariff law authorizing the governor in council under certain conditions to impose by proclamation export duties on saw logs. The finance minister also announced the government's intention to ask power to impose export duties on pulp wood and on certain ores produced in Canada. The conditions under which these duties are to be imposed relate to the proposed action of the United States in fixing the new lumber tariff.

According to the United States statutes the circular No. 17975, amendments to navigation rules, Art. 21, par 1, is amended so as to read as follows: "Vessels of above fifteen tons burden carrying freight or passengers for hire." Now the Record contends that these or any other vessels whether above or below fifteen tons could not carry freight, it is possible, however, for them to carry cargo or cargoes, but not freight. As we have frequently pointed out, freight is the money earned for carrying cargo, nor should the terms be confused.

A PROPER RULING.

For the first time in many years the secretary of the navy has interposed his veto on the application of a junior officer to leave the naval service.

In the present case three of the cadets at Annapolis, George Weber of Arkansas, H. L. Collins of Pennsylvania, and P. L. Pratt of Illinois, sought to resign. They had completed four years' service at the academy, the last of which was devoted to the engineering branch, and desired to leave to engage in private business.

Secretary Long, however, found that the engineer corps was sadly in need of officers, owing to the rapid depletion of the ranks of the older engineers in late years, and he decided that as these young men had been educated at the expense of the government, they should render service in return.

The cadets on admission to the academy are required to pledge themselves to serve the government not less than eight years, so these young men now will be obliged to take the usual two years' course that rounds out the Annapolis course, at the end of which time they will receive their commission as assistant engineers in the navy, and be regularly assigned to duty.

RETALIATION.

A prominent lumberman, member of one of the largest lumber firms on the lakes, says this week that it was reported from what he considered a most authentic source that the Canadian government has issued an order to let no logs leave Canada for the United States without an order direct from the minister of customs at Ottawa. If this order is carried into effect the rafts of logs that were

to come from Canada, more especially the Georgian Bay region, to the Saginaw valley this season, upwards of 200,000,000 feet, may not be shipped for some time, and what the outcome will be it is hard to tell, especially as we want lumber the worst kind of a way and it is getting scarce on this side, anyway.

LAUNCH OF THE POLYNESIA.

The Globe Iron Works Co. launched on Saturday the large steel schooner Polynesia, illustrated in the current issue of the Record.

The launch was a complete success, as the Polynesia struck the water on a fair line, end for end, and builders or owners could not desire anything more perfect than the manner in which the new ship was slid into her native element under the auspices of Mr. Corrigan's eldest daughter, who, returning from the launch of the Amazon at Chicago, was given the honor of christening the Polynesia a few days later at Cleveland.

The new schooner Polynesia is a sister ship to the Amazon, her principal dimensions being 388 feet over all, 376 feet keel, 46 feet beam and 26 feet depth of hold.

It would almost seem superfluous to mention that a steel schooner or consort of the foregoing dimensions could not even have been considered a few years ago, in fact, anyone who might have suggested such a craft would have been thought a fit subject for an insane asylum.

The loading of the Polynesia's sister ship (for they are ships in disguise), shows that she loaded 217,000 bushels of corn at Chicago, an almost unprecedented cargo, and weighing over 6,000 tons, this, too, on almost ballast draft.

Capt. James Corrigan, owner of the Polynesia, is a pioneer in large vessel building. He has always kept ahead of the requirements and this time he seems to have eclipsed even his former records. Capt. John Corrigan also travels on similar lines and believes in large tonnage, as several of his boats clearly indicates.

RETIRING FROM THE RANKS.

Our old-time friend, Egbert P. Watson, of the Engineer, New York, announces that he has sold his entire interest in the Engineer, but will remain as editor and general manager of that publication until Jan. 1st, 1898, from which date we shall doubtless be obliged to bid adieu to one of the ablest technical writers on marine engineering of the present day. As the Marine Journal, New York, pertinently states: "The thought has frequently occurred to us, have the engineers as a profession during these seventeen years of the publication of the Engineer appreciated the untiring efforts that their professional brother has put forth for their benefit and instruction? This question can only be answered by the individual members of the marine engineering profession themselves. It is our opinion, however, that had Mr. Watson's services been fully appreciated by his craft he would not have gone out of the business as long as he was able to wield a pen. It gives us pleasure to announce that this veteran marine engineer has very flattering business prospects for the future and none wish him more brilliant success or a longer lease of life than the Marine Record."

A VICTORY FOR KREMER.

The Circuit Court of Appeals here decided an important case on Saturday last. On the night of the 19th day of April, 1893, the schooner "Sheboygan," laden with a cargo of about 16,000 bushels of corn, was lying in the Chicago River. The steamer "City of Naples" came in on the morning of that day, light, and made fast to the light-house pier. It began to blow from the east and as the gale increased the schooner pulled around into the slip to the leeward of the steamer. The gale still increased and about midnight the stern lines of the Naples carried away and she drifted down on to the schooner and struck her. The engine was then started and the helm put hard-a-starboard and she was kept away from the schooner until the wheel chains broke, when the Naples again drifted down on the Sheboygan and with her wheel cut holes into her side so that she filled and sank, and vessel and cargo became practically a total loss.

The case was tried before Judge Grosscup, who pronounced it an inevitable accident, and this decision was affirmed in the Court of Appeals.

Mr. W. H. Condon and Mr. H. D. Goulder appeared for the schooner and cargo, and Mr. C. E. Kremer, of the firm of Schuyler & Kremer, Chicago, for the "City of Naples."

A LONG CRUISE.

Captain Charles J. Holmes, of Port Huron, who was in command of the steamer Wallula when she burned off Ashtabula last season, will leave shortly on a trip around the world in the 22-foot sloop yacht, Ramona. One companion will accompany him. The two will sail through the lakes, and down the St. Lawrence river. The route is to South Greenland, past the Shetland Islands to Scotland and by the North Sea to England, where the yacht will be prepared for a trip through tropical waters.

Capt. Holmes commenced his seafaring life when but 11 years of age. He has been all over the world before the mast, and has had some interesting and unique experiences, eventually making a navigator out of him.

WRECK OF THE PEWABIC LOCATED.

The long lost steamer Pewabic has been located, after a search extending over thirty years. The wreck was found by a wrecking expedition from Milwaukee, working on the steamer H. A. Root. It lies six miles south-southeast from Thunder Bay island, Lake Huron, in twenty-seven fathoms of water and is in the regular track of steamers. The wreck lies on almost an even keel. The upper works are entirely gone, but portions of the bulwarks are standing and the main deck appears to be intact. The hull seems also to be in good shape. The Root has returned to the wreck and will make a more careful investigation of the hull. The expedition was sent out by the American Wrecking and Salvage Co., of Milwaukee. The company is working under a contract with the underwriters for the recovery of the wreck and cargo. The latter consisted largely of copper in barrels on the main deck and it is believed that it can be recovered by the diving apparatus on the Root. From one to four expeditions per year have been sent to the Pewabic for these many years. Several lives have been lost in the search. There is no doubt but that the value of the cargo has been expended in vain efforts to locate the steamer, but when another season came there were other people who were certain they could recover the valuable cargo. There has always been a belief that the safe of the steamer contained a large amount of money, but this has now been disproved. The Pewabic was lost by collision with the steamer Meteor just after the close of the war. A large number of passengers were lost with her, and the disaster, next to the loss of the Lady Elgin, was the most serious in the history of the lakes.

BUFFALO COAL TRADE.

The following statistics of the coal trade of Buffalo were computed by Mr. William Thurston, secretary of the Merchants' Exchange:

Receipts and shipments by railroad not reported by request. From opening of navigation: Lake receipts none this year or two preceding years. Shipments by lake to June 1st 1898, 850 net tons, as compared with 330,980 net tons in 1896 and 259,788 net tons in 1895. Receipts by canal to June 1st none, as compared with 3,586 net tons in 1896 and none in 1895. Shipments by canal to June 1st none, as compared with none in 1896 and 896 net tons in 1895. The aggregate shipments by lake thus far this year show a decrease of 132,139 net tons under 1896, and a decrease of 60,938 net tons under 1895.

Lake freights hence from opening of navigation to June 1st 25s20c to Chicago and Milwaukee, 20c to Duluth and Lake Superior ports, 25c to Green Bay and Racine, and 40@35c to Saginaw. A year since the rates were 40@60c to Chicago, 40@55c to Milwaukee, 25c to Duluth and Lake Superior ports, 45@55c to Green Bay, 25c to Toledo and Detroit, 45@60c to Racine, 35@40c to Saginaw, 25@35c to Bay City, and 25c to Ashland.

The distribution of coal thus far this season by lake was about as follows: 99,965 net tons to Chicago, 41,000 tons to Milwaukee, 18,300 tons to Duluth, 3,850 tons to Racine, 1,000 tons to Green Bay, 30,300 tons to Superior, 1,500 tons to Saginaw, 2,800 tons to Kenosha and 75 tons to Alpena.

TRADE LITERATURE.

A very handsome illustrated catalogue of yachts and launches and boats has just been issued by the Gas Engine and Power Co. and Chas. L. Seabury & Co., consolidated, of Morris Heights on the Harlem, New York, with descriptions of the various types of craft they have built and with the machinery with which they are equipped.

Since the consolidation of this enterprising concern a big business has been done and all the owners of yachts from these works unite in testimonials to their satisfactory qualities.

The catalogue is of large size and is well printed. Besides handsome instantaneous photographs of the boats in motion, there are pictures of their engines, boilers, etc. The company is rapidly gaining renown the world over for their superior high-speed and cruising steam yachts and launches, and with the perfect plant which they now have on the Harlem, they are able to build not only pleasure but every class of business craft.

All those who are interested in boat building, either for business or pleasure, and who contemplate purchasing, will do well to send for the company's catalogue; or, should they chance to be in New York, a visit to their works on the Harlem river, will well repay them, for there they can see boats in all stages of construction.

The office of the company in New York city is at No. 50 Broadway, and the works are, as we have said, well worth inspecting by any one interested in power yachts of any size, down to the speedy, safe and comfortable little naphtha launch.

HISTORIC WRECKS.

In 1717, a ship, the pirate Whydah, commanded by the notorious Bellamy, laden with spoils, and seeking more, was wrecked not many miles north of the same spot in a terrible gale. More than one hundred dead bodies lay along the shore, and it was said all but two of the crew (an Englishman and an Indian) perished in the waves. It was a tradition on the Cape for years that the Englishman, disguised, used to visit the scene of the shipwreck from time to time to supply himself with money buried from the wreck. If true, the man must have had great strength of body and presence of mind to find and bury treasure after such a fearful tussle with wind and wave when all his comrades were drowning near him. A short time before the wreck, Bellamy had captured seven prizes, and placing seven of his crew on one of these—the Province Snow—had promised the Cape Cod captain his vessel if he would pilot his fleet into Provincetown Harbor. It is said that this captain, watching his chance when the pirates were stupid with drink, ran his vessel close inshore, where the crew escaped with their lives, but were taken, and afterwards tried before a special court of admiralty in Boston, and executed the following November. The Whydah, following the pilot, ventured too near the coast, and the gale of April 26, 1717, drove her to her destruction. An old account, written by Levi Whitman in 1810, says: "At times to this day there are King William and Queen Mary's coppers picked up, and pieces of silver called cob-money. The violence of the sea moves the sands upon the outer bar, so that at times the iron caboose of the ship at low ebb has been seen."

Judge Sewall tells the same story of the wreck. Thoreau found one of the pennies, and his "Wellfleet oysterman" said that he had seen the iron caboose of the Whydah on the bars at an extremely low course of tides.

Captain William Kidd, the notorious pirate, who was tried in London, and executed for piracy in the year 1701, had a ship called the Quidah, or Quedagh, an East India merchantman which he had captured near the mouth of the Red Sea. He then sailed for the West Indies, and finding that the English had proclaimed him pirate and ordered his arrest, left the Quedagh with twenty-two of the pirates and sailed to the north. There is a tradition that these pirates transferred their property to another less unwieldy ship and burned the East-Indiaman. Another tradition is that she was brought into the Hudson, and being chased by an English man-of-war, was sunk near the Highlands with most of her treasure. It is certain that there was visible for a time the wreck of some large ship sunk in the sands at that place.—Harper's Round Table.

FIRST AMERICAN BUILT IRON SAILING VESSEL.

I have received the following from the Pusey & Jones Co., Wilmington, Delaware:

"We noticed the enclosed paragraph concerning the death of our late Mr. Jones, in last week's Record:

"John Jones, aged 79, one of the founders of the Pusey & Jones Co., died on Saturday last. Mr. Jones was born at Lancashire, Eng., his parents emigrating to Delaware about 1821. In 1849, with Joshua L. Pusey, he founded the firm of Pusey & Jones. Mr. Jones in 1866 withdrew, the Pusey & Jones Co., shipbuilders, being then formed."

"You will note that the last line reads: 'Mr. Jones, in 1866, withdrew, the Pusey & Jones Co., shipbuilders, being then formed.' For the sake of accuracy, we would like to correct this by stating that the first iron vessel built by this company was constructed in the year 1853; and we also mention that it had the distinction of building the first iron sailing vessel constructed in the United States—the 'Mahlon Betts,' built in 1854; and since the first-named date, this company has been building ships continuously. Feeling that you would like to have the slight mistake corrected, we are,

"Very truly yours,
THE PUSEY & JONES CO.
W. W. PUSEY, Treasurer."

H. C. BURRELL,

Marine Reporter.

We can Supply Men and Officers to Passing Vessels

BOAT ON THE RIVER
AT ALL HOURS,
NIGHT OR DAY.

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two short.

Our boats are
white. We'll treat
you white and deal
with you

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EDWARD A. BUNKER,
ROOM 617, 27 AND 29 WILLIAM ST., NEW YORK.

SOME LAKE HISTORY

Special Correspondence to the Marine Record.

Sombra, Ont., June 15, 1897.

On August the 8th, 1862, I was master of the schooner Saranac, then lying at Marquette, Mich. The schooner Oriole, Capt. Daniel McAdams, was loaded and they came to me to ask for the loan of a kedge anchor and a couple of coils of rope to help warp her out of the harbor, as the wind was not only light, but dead ahead. Now compare this with the navigation in and out of Marquette today—however, not only did McAdams get kedge anchor and hauling lines, but, we mustered together, my boat and crew, Capt. David Becker, of the Iroquois, and his crew, Capt. McCleod, of the schooner Plover, with crew, and in short order we got Dan clear of the harbor, with all sail set and his schooner moving along lively when we left her.

On the following day the schooners Saranac, Iroquois, Plover and bark Frontenac were all loaded and ready to leave, but the wind was too light for us to work out of port and we waited until the weather freshened. The next day I learned from Capt. Becker that the steamer Illinois had arrived during the night with her bows stove in and that she was partly sheathed with canvas to stop the leak after colliding with the schooner Oriole, which we had left all well the day before. I at once boarded the steamer and tried to learn further particulars. Capt. Ryder, of the Illinois, said that they had run down something and that while they had collided with some craft, he thought that she had suffered no damage, furthermore that his owner, Mr. Cain, would not permit him to stop the steamer so as to ascertain the damage, if any, although some lady passengers told me that they heard the crew crying for help. Hearing this report and knowing that the schooner could not be far off port, Capt. Becker and I hustled around, mustered all the captains in port and started to take charge of the steamer, so as to proceed in search of the wreck—however, as we were boarding her

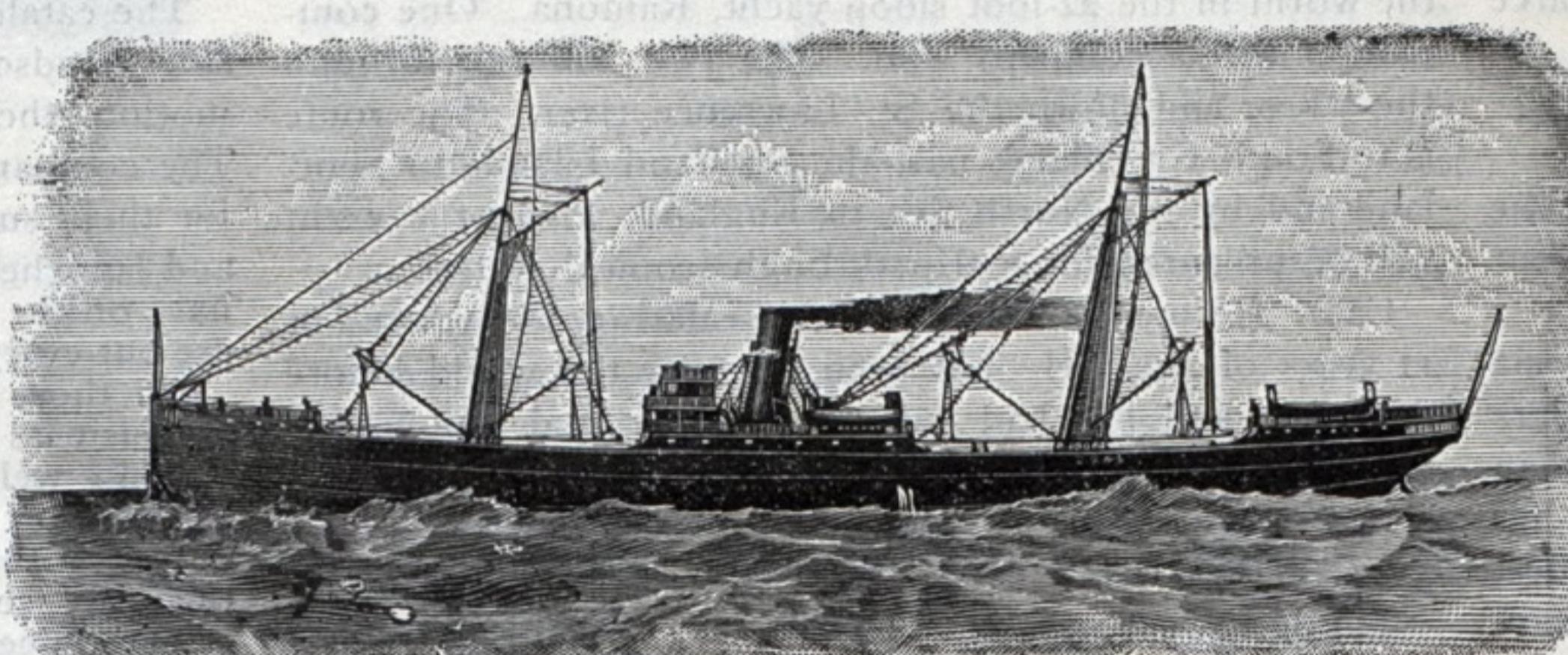
F. W. WHEELER & COMPANY,

BUILDERS OF ALL KINDS OF

Iron, Steel, and
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FOR LAKE OR OCEAN SERVICE.

West Bay City, Mich.



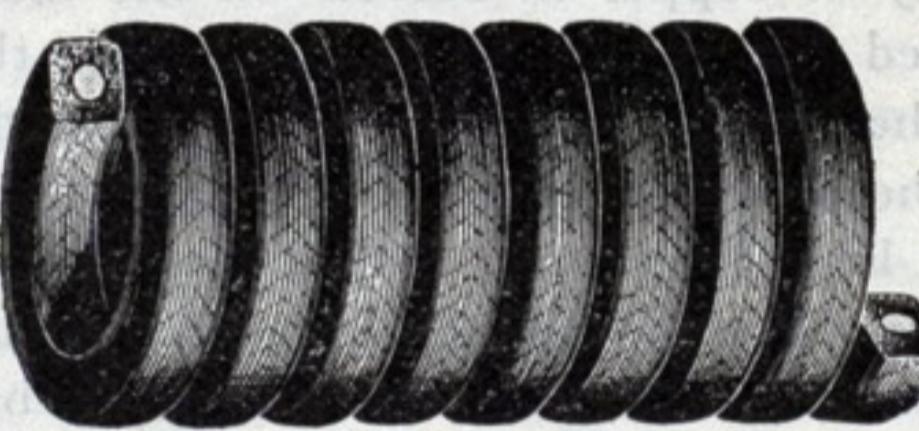
F. W. WHEELER, Pres.
J. S. PORTER, Treas.

H. T. WICKES, V. P.
G. W. STIVER, Sec'y.

FRONTENAC

Iron Works.
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the lines were cut and she backed away from the dock and putting on a full head of steam, got clear before we could board her.

A fresh breeze springing up, all four schooners got under-weigh on the understanding that we should find the wrecked Oriole if it was possible to do so. At noon the Plover sighted the wreck and as the wind was light, each schooner lowered her boat and pulled for the now sinking vessel. On getting alongside we found that she had been fairly rammed, the stern was cut off, her bottom had actually dropped out of her with all of the ore cargo, and she was a total wreck.

The master of the Frontenac thought that we ought to strip the vessel and take anything of value out of her, but I told him that we were there to save life, not to wreck. Later we sighted part of the stern of the schooner about half a mile away and on reaching it found a trunk and a woman's hat, which we put into Capt. Becker's boat, returning to our schooners with the intention of keeping a good lookout for anything that might be picked up. The weather freshened up and Capt. McLeod, of the Plover, sighting the brig Globe asked her to keep a good lookout for any boats or floating wreckage. At about 5 p. m. the Globe picked up a boat half full of water with the cook of the schooner in her, the only one saved.

Capt. McAdams had done his first sailing with me, but himself, wife and her mother Mrs. Johnson, wife of fish merchant Johnson, of Cleveland, were all lost. Capt. McAdams had been given charge of a vessel by Mr. V. Swain through my influence, and later he took charge of the Oriole, owned by Mr. Winslow. Capt. McLeod's vessel, the Plover, was also owned by Mr. Winslow. I understand that Capt. Dan McAdams, who was a smart energetic man, has now a brother living in Cleveland. Capt. Redmond Ryder and I were schoolmates, but I also got him his first command, the small schooner Meteor. Later he got charge of the new steamer Meteor, the vessel that ran down the Pewabic, then in charge of Capt. Thos.

Wilson, and she was named in honor of the little schooner.

The Mr. Cain that I mentioned as being owner of the Illinois, lived in Detroit, and the steamer traded from or between Cleveland and Lake Superior. Cleveland people, to the number of about 200 persons, swore that they would burn the Illinois if she came into that port again, so she very wisely kept away. As for Mr. Cain, her owner, he would have been sent to the land of Nod and made an angel of, if they could have captured him.

Some time afterwards I was again at Marquette and found Capt. Ryder and his wife staying at the light-house there. I called on him in no friendly mood and asked why he did not stop his boat to rescue the crew of the Oriole. He again said that his owner, Mr. Cain, would not allow him to stop, also that he thought that he had passed clear across her stern instead of cutting it clear off. They had sighted the Oriole twelve minutes before the collision, his mate ordered the wheel to port and it was put hard a starboard, thus walking clean through the stern of the schooner, who was showing a torch, blowing a horn and doing all that was possible to avoid trouble.

I told Capt. Ryder to hide in the woods and be company for wolves and snakes, for that a person who would not slow down his boat under such circumstances had no right to any better surroundings. He never came to Cleveland after that. Later he sailed a barge which foundered on Saginaw Bay with the loss of all hands, at least I was so informed, but for my own part, I was in Natal, South Africa, that season. The account of this collision and loss of life was not printed at the time, for in those days little interest was taken in the pioneer and baby days of the lake marine. CAPT. CHARLES GALE.

BUILT ON TIME PAYMENTS.

A number of the big steel lake steamers were built on bonds—what is known as the 50 per cent plan—and running up to twenty years with interest at 5 per cent per annum, says the Detroit Free Press. A few more seasons

like the present, and little more than the interest on these bonds can be paid, let alone the principal. The bondholders by the plan are half-owners in each vessel. The owners of the other half have but to pay 2½ per cent interest, or \$5,000 on a \$200,000 vessel. Though they are all big carriers, it can be seen that they are not equal to much more than this in the present state of the freight market. The bondholders are of course fully insured against all form of loss, so that they stand to lose only on the natural lowering of value through the passing of time and the construction of still larger vessels.

VISIBLE SUPPLY OF GRAIN

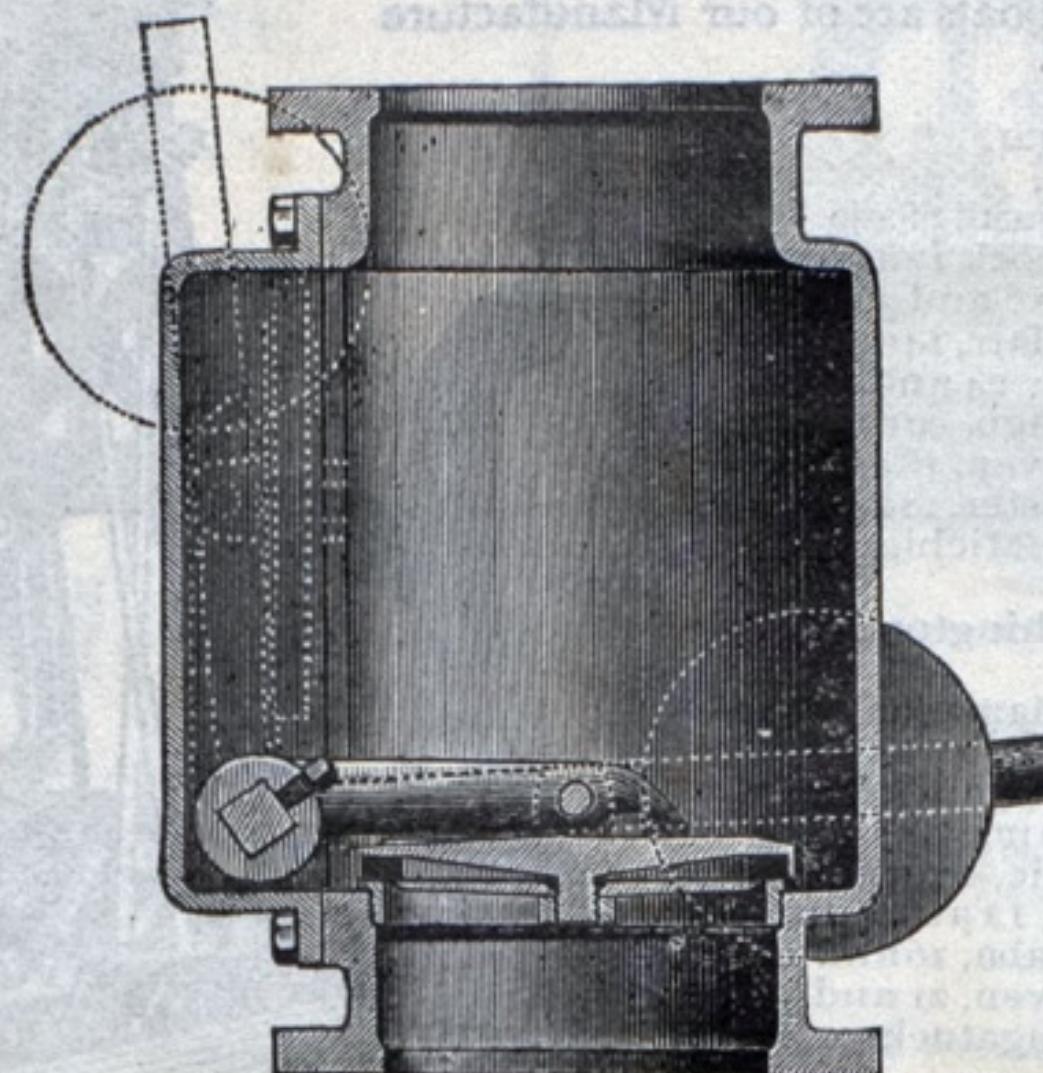
As compiled for The Marine Record by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT, Bushels.	CORN, Bushels.	OATS, Bushels.	RYE, Bushels.	BARLEY, Bushels.
Albany		30,000	50,000		
Baltimore	479,000	1,120,000	157,000	130,000	
Boston	284,000	910,000	225,000	1,000	23,000
Buffalo	867,000	567,000	850,000	51,000	342,000
" afloat.					
Chicago	4,687,000	7,134,000	1,900,000	709,000	32,000
" afloat.					
Cincinnati	1,000	3,000	8,000	1,000	1,000
Detroit	33,000	47,000	19,000	19,000	
" afloat.					
Duluth and Superior	2,027,000	8,000	928,000	385,000	255,000
" afloat.					
Indianapolis	22,000	143,000			
Kansas City	131,000	164,000	166,000	6,000	
Milwaukee	130,000	3,000	6,000	307,000	68,000
" afloat.					
Minneapolis	10,330,000	81,000	211,000	15,000	12,000
Montreal	345,000	21,000	553,000	37,000	46,000
New York	1,123,000	1,567,000	2,036,000	459,000	147,000
" afloat.					
Oswego		31,000	56,000	28,000	20,000
Peoria		5,000	21,000	1,000	
Philadelphia	188,000	468,000	79,000		
St. Louis	153,000	475,000	115,000	8,000	
" afloat.					
Toledo	455,000	585,000	96,000	72,000	
" afloat.					
Toronto	83,000		50,000		24,000
On Canal	382,000	1,006,000	67,000	121,000	209,000
On Lakes	663,000	2,149,000	2,106,000	30,000	323,000
On Mississippi	2,000	123,000	88,000		
Grand Total	22,686,000	16,621,000	9,756,000	2,361,000	1,517,000
Corresponding Date 1896	49,486,000	9,406,000	8,430,000	1,590,000	877,000

THE EXCELSIOR BACK PRESSURE VALVE.

(Illustrated.)

One of the necessary evils attendant upon the use of exhaust steam on heating systems is the use of a back pressure valve. We say evil because anything that offers the slightest obstruction to the free passage of the exhaust when the valve is not needed must be considered as such, and as heretofore constructed all back pressure valves, when thrown wide open, leave a more or less tortuous passage for the steam, and in many cases the valve itself remains



NEW EXCELSIOR VALVE.

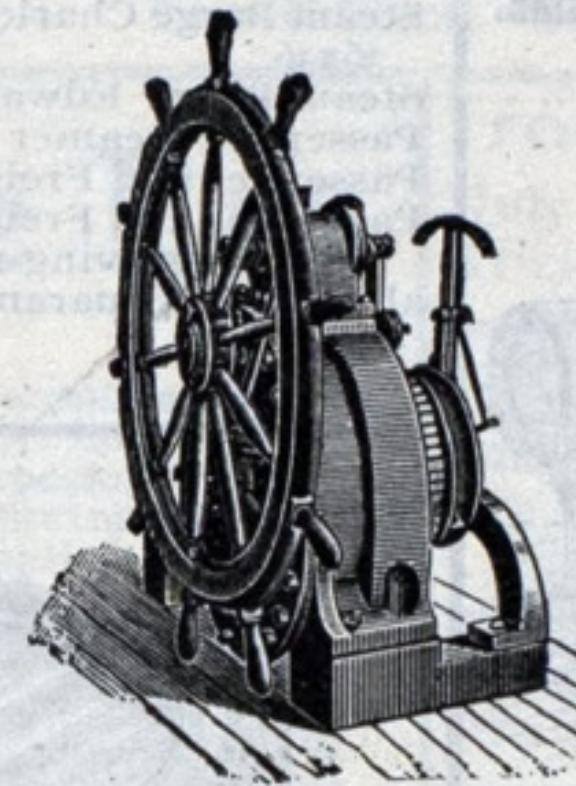
directly in its path to deflect or partially obstruct the flow and it is the custom with many careful engineers at the beginning of the season when valve is no longer needed to entirely remove the interior parts. Another serious objection is the disagreeable pounding of the valve on its seat, due to pulsations of the exhaust. To overcome this many designs using springs, levers, balanced valves, etc., have been brought out, all of which require more or less attention and often fail to work properly. The cut

clearly shows the construction and interior arrangement of the Excelsior Back Pressure Valve, which is now being manufactured by the firm of Jenkins Brothers, 71 John street, New York, and it will be at once seen that the valve fully meets the requirements of an ideal valve. It not only has the fewest possible parts and is entirely free from complication, but when not in service the valve and all interior parts can be quickly thrown back into the cover, where it is entirely out of the exhaust passage and offers not the slightest obstruction, but leaves a full, free, straight passage, consequently requires no further attention. The seat is broad and flat and as the valve contains the Jenkins Disc, it is perfectly noiseless when in service, never sticks and gives long service. The cover can be easily and quickly removed, bringing with it the whole interior parts for examination or repair if necessary. As a relief valve or free exhaust valve for a condensing engine this valve will especially commend itself to engineers. It can be placed and used in any position and from its shape is especially adapted for use in corners or close to a wall.

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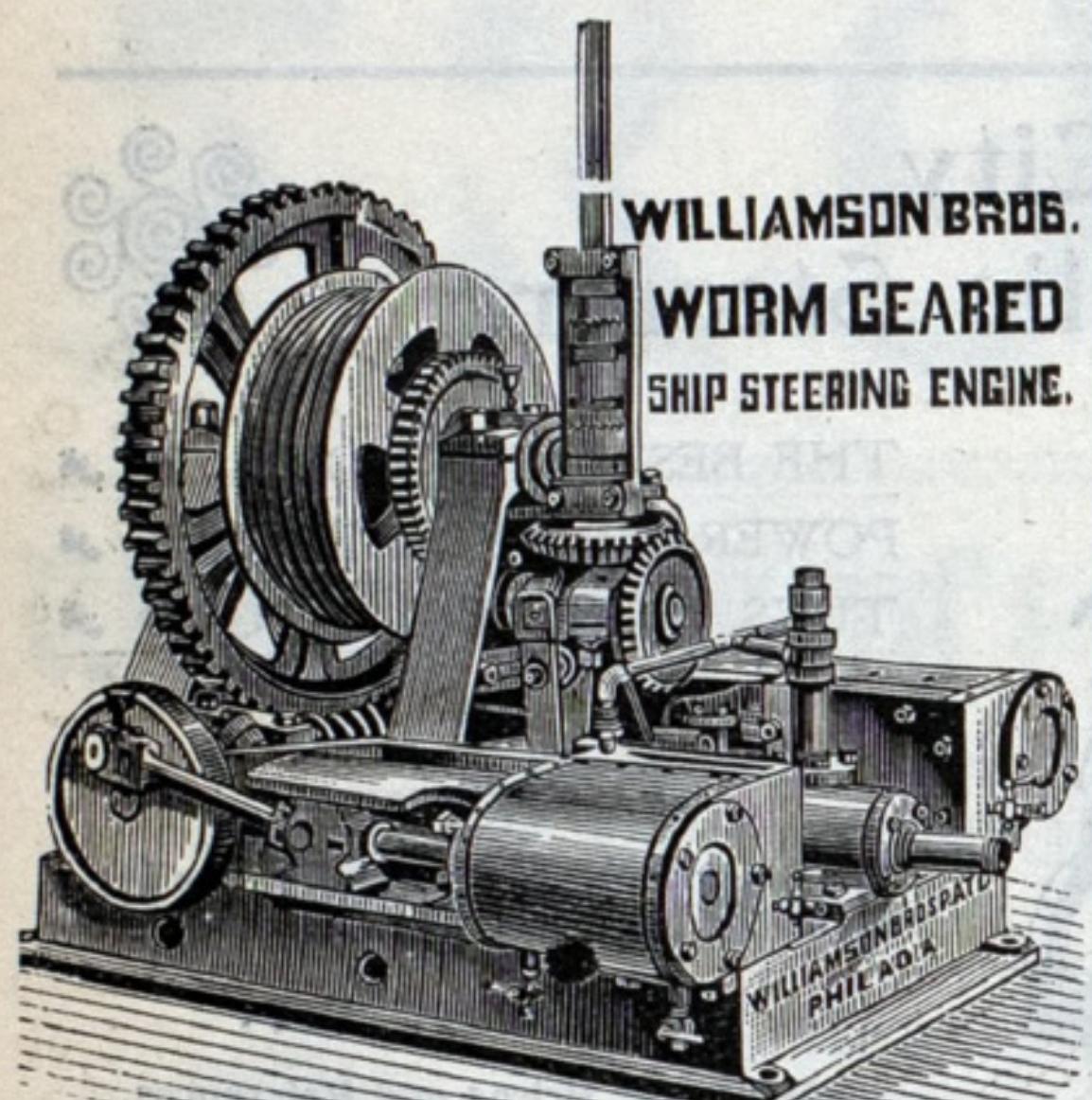
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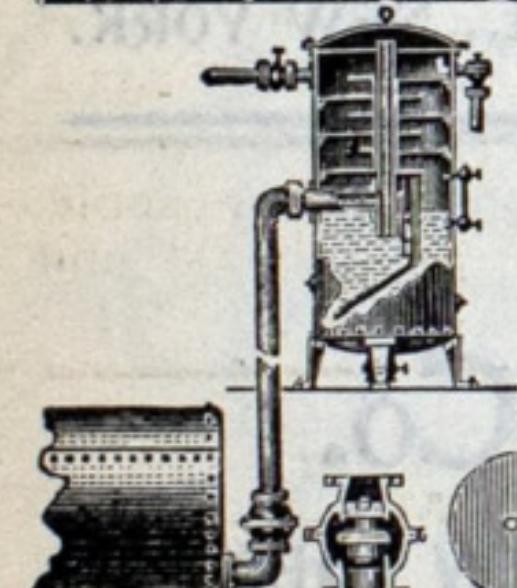
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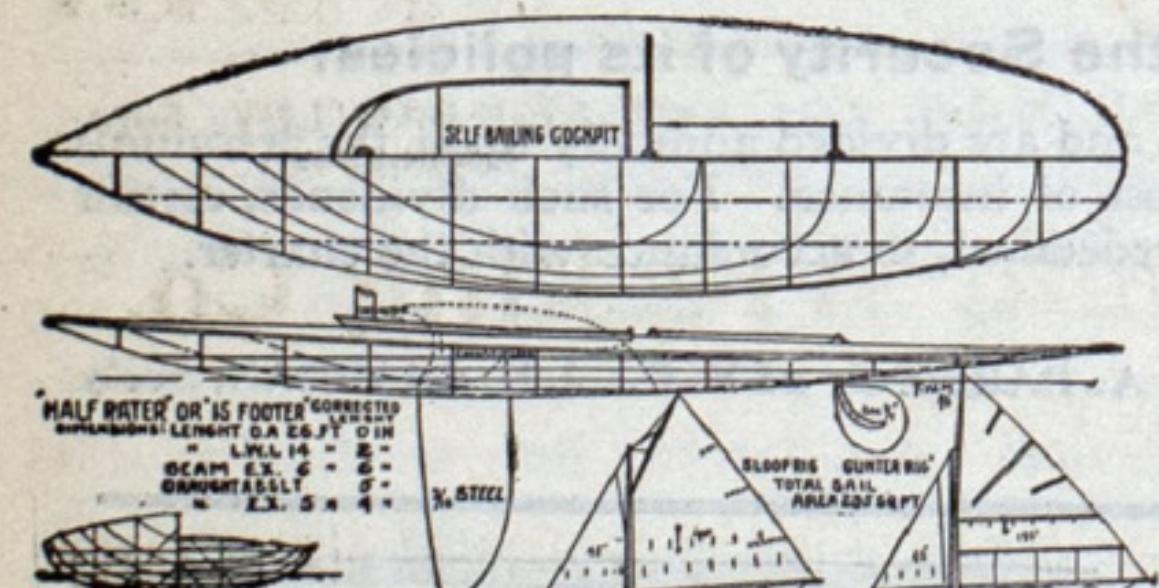
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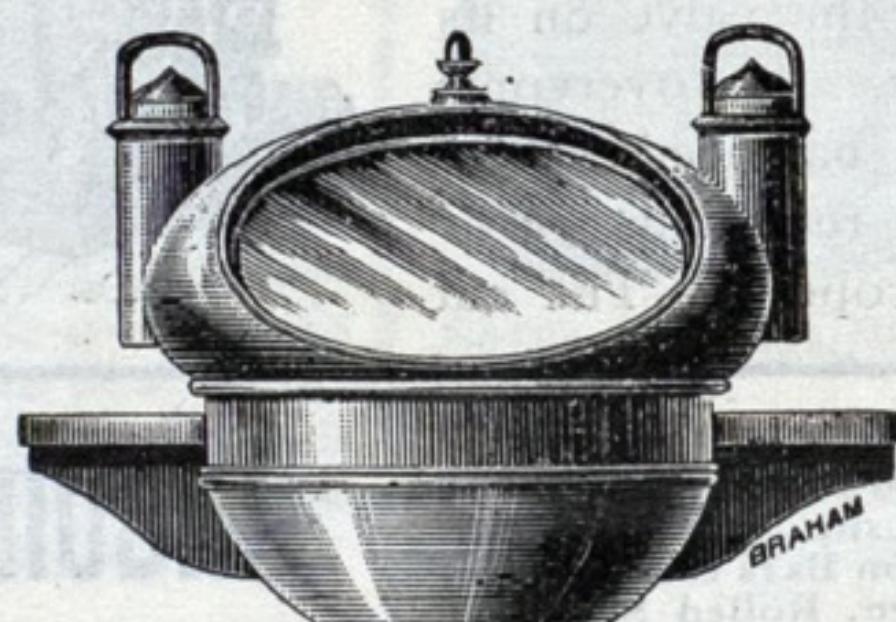
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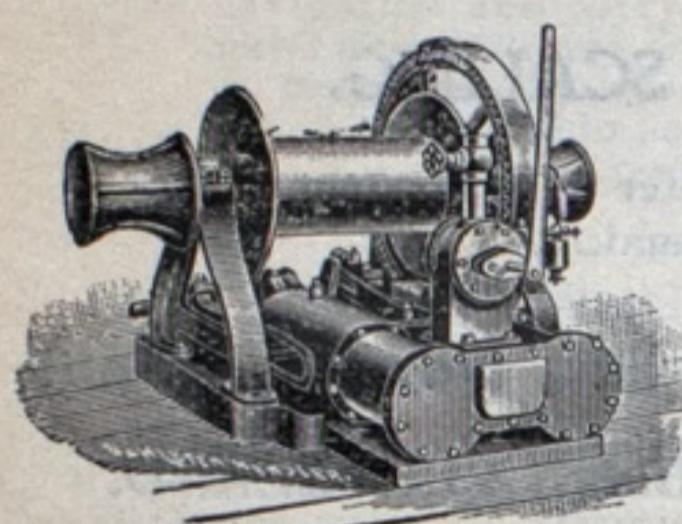
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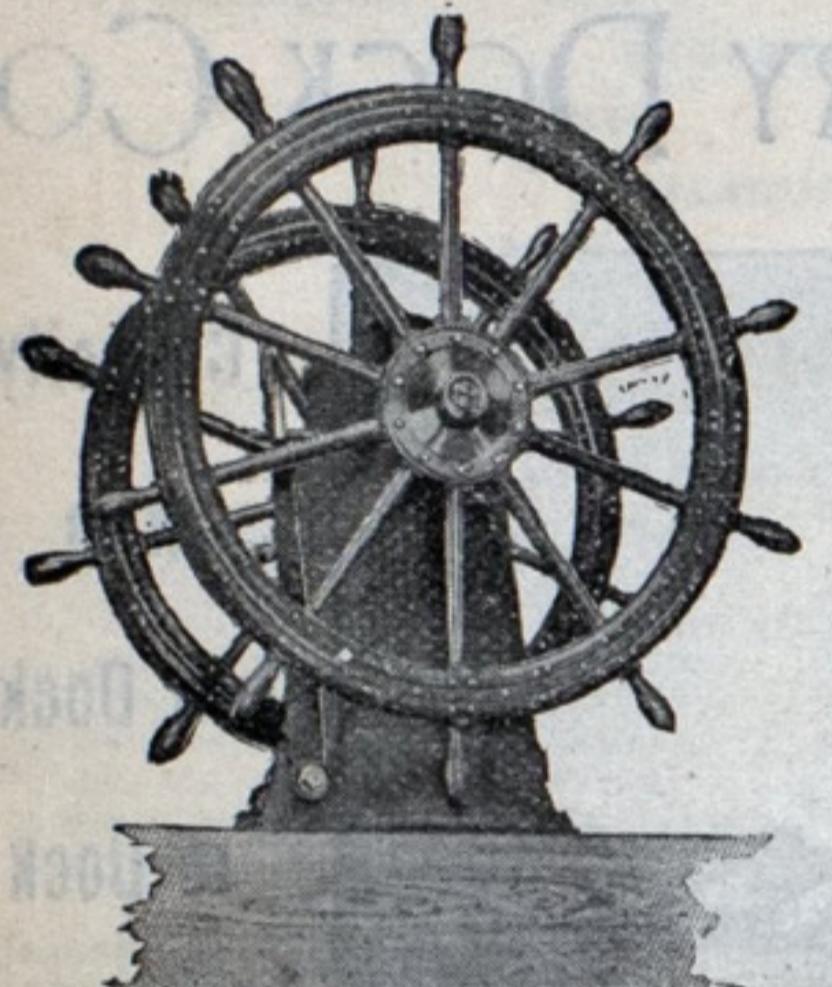
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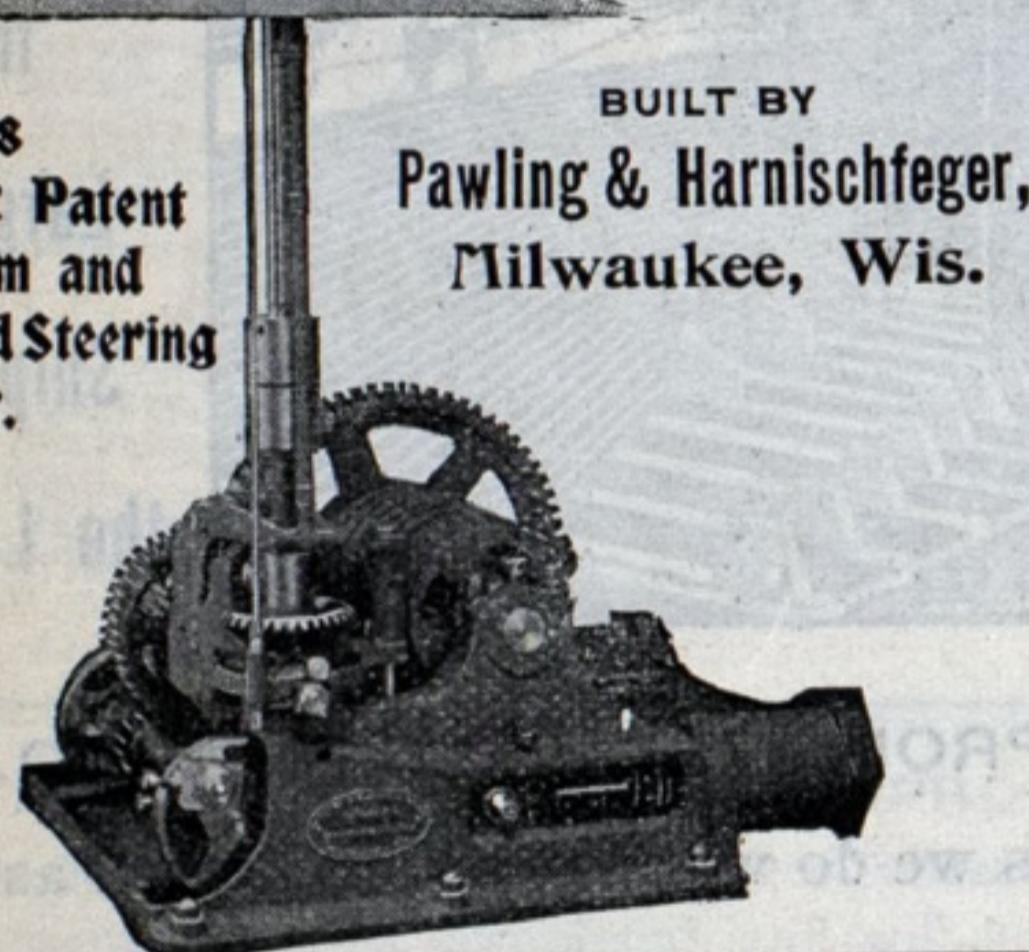
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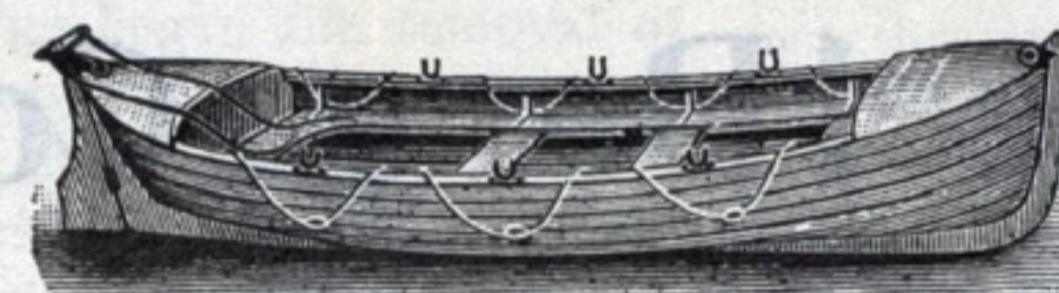
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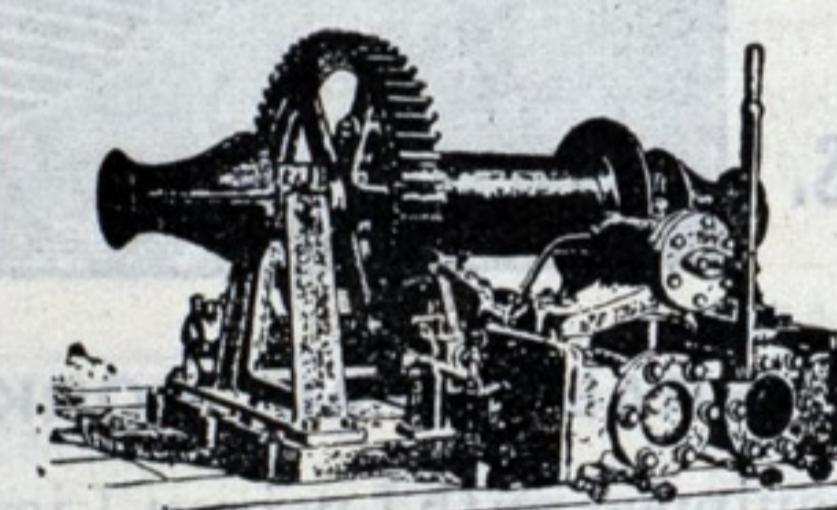
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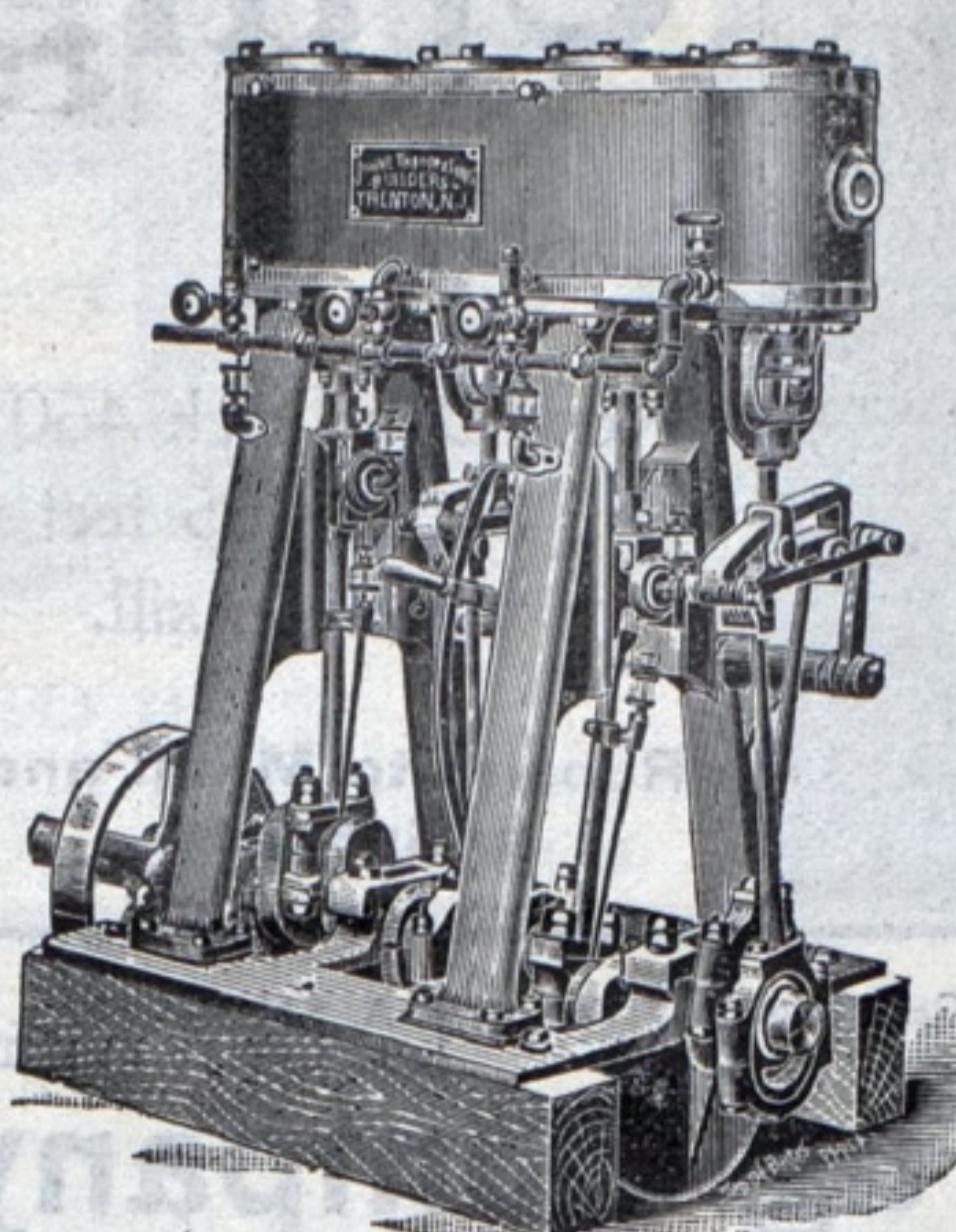
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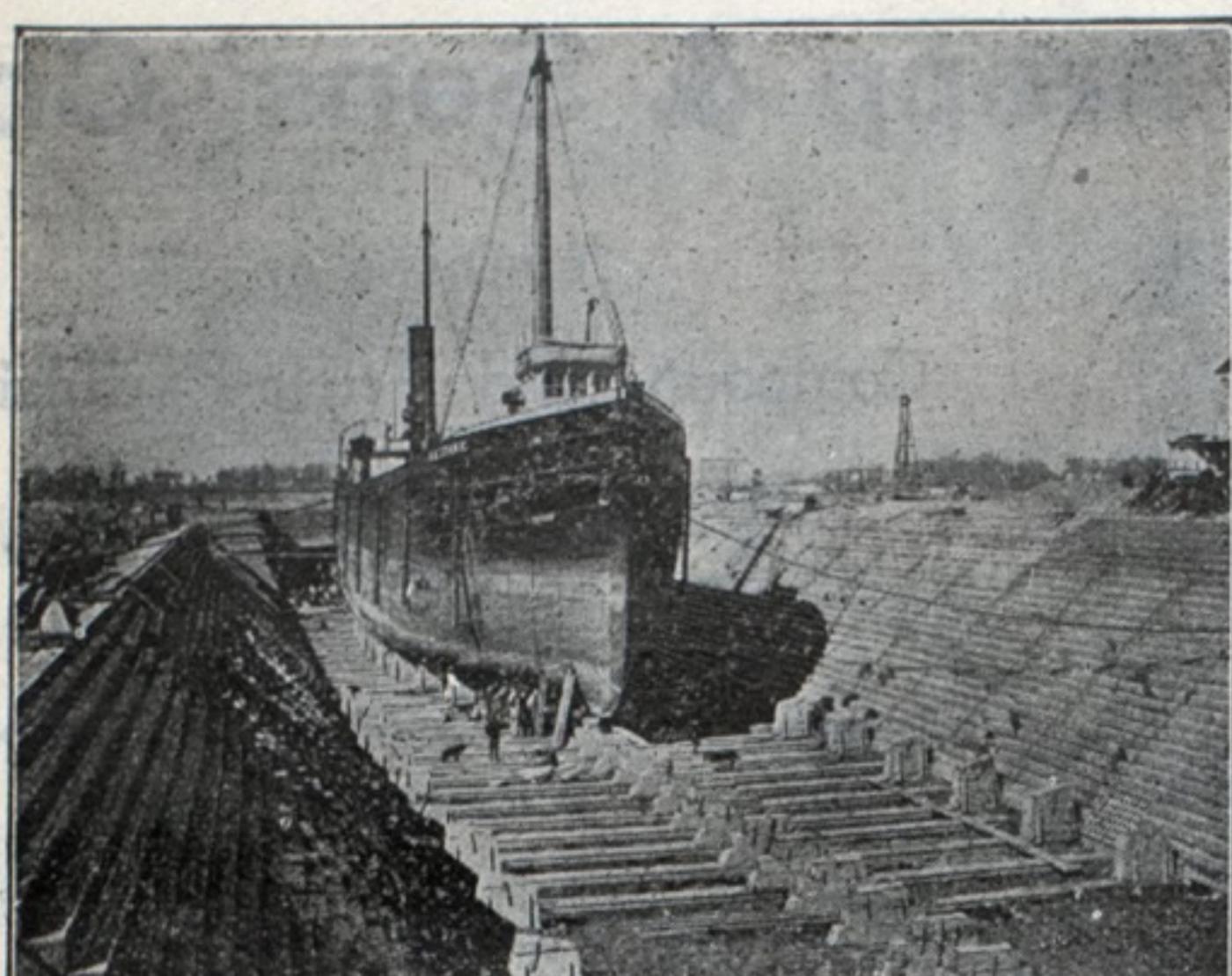
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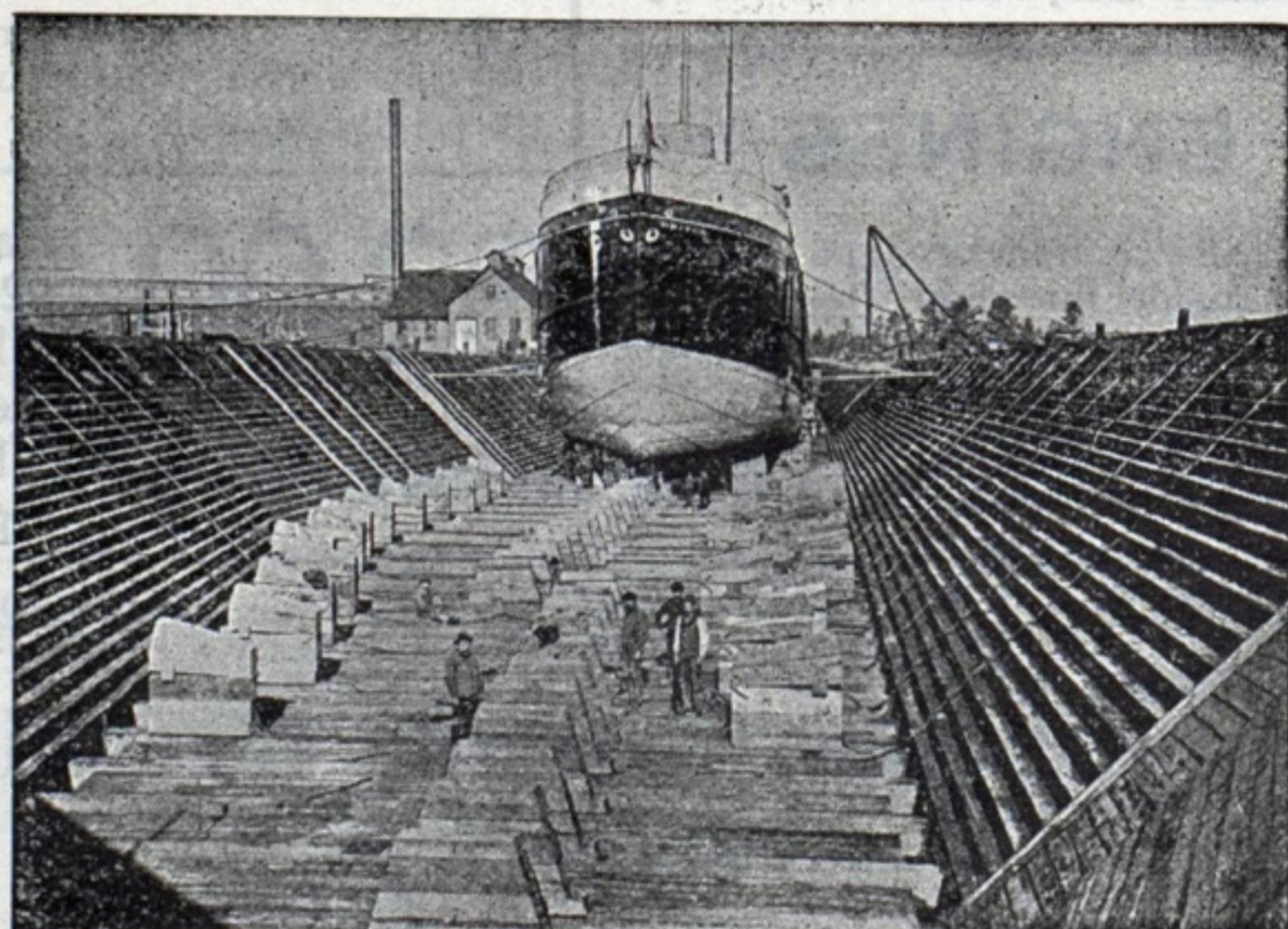
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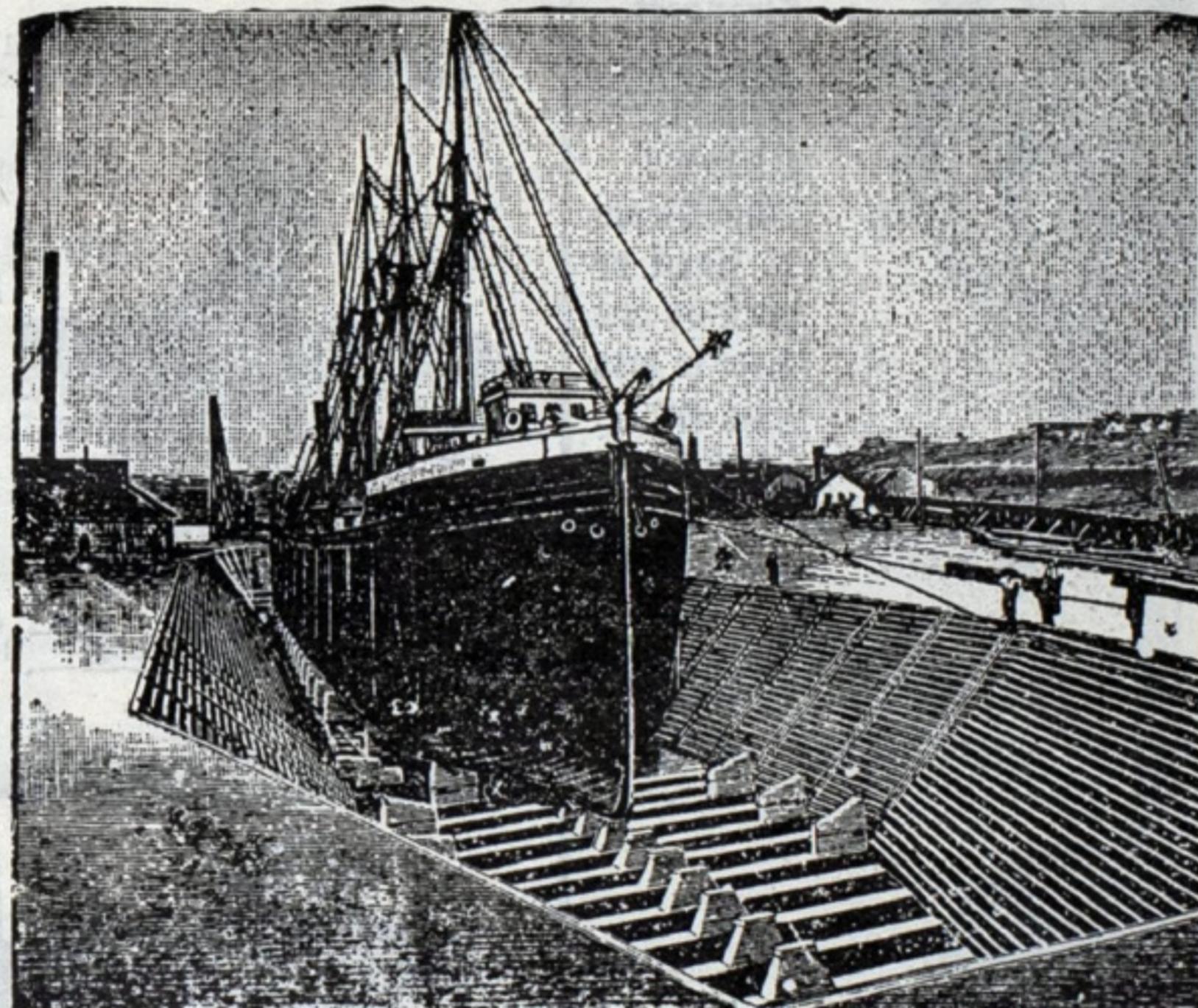
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